

Конструирование деревянных моделей

МОДЕЛЬНЫЙ КОМПЛЕКТ - комплект формообразующих изделий, необходимый для образования при формовке рабочей полости литейной формы, включая литейную модель, стержневые ящики, модели литниково-питающей системы, формовочные, контрольные и сборочные шаблоны для конкретной отливки ([ГОСТ 18169-86](#)).

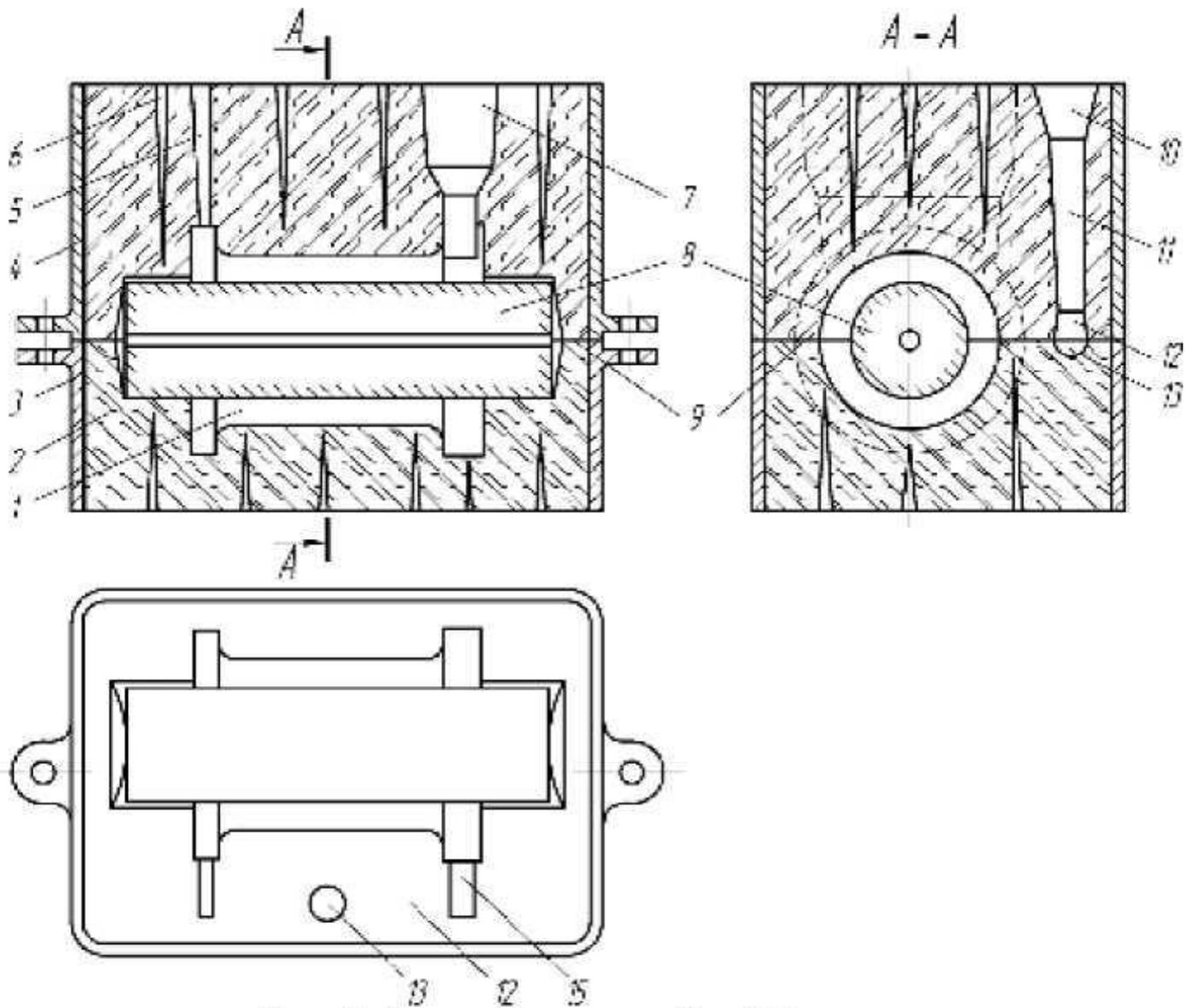


Рис. 1. Устройство литейной формы:

Классификация

моделей:

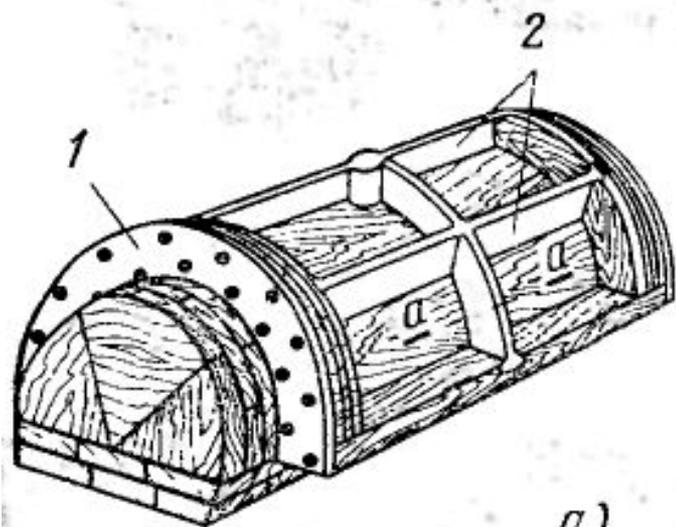
- Тип производства
- Материал модели
- Материал отливки
- Способ изготовления литейной формы
- Конструкция модели
- Сложность изготовления модели
- Точность изготовления модели

Материал моделей

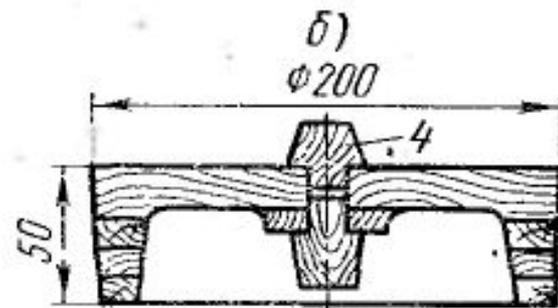
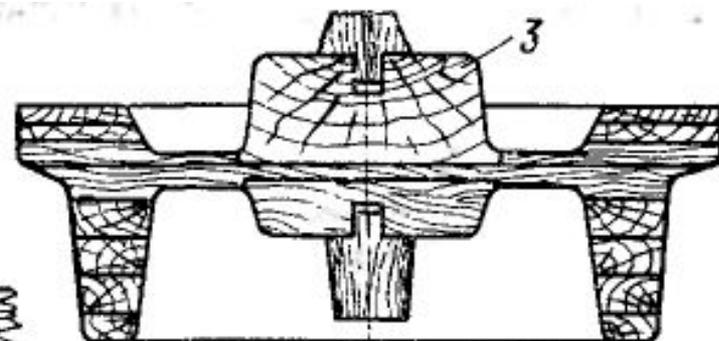
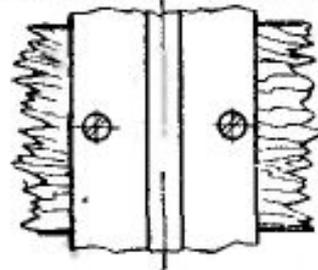
- Дерево
- Алюминиевые сплавы
- Бронза и латунь
- Чугун
- Сплавы свинца с сурьмой
- Гипс
- Портланд-цемент

Классификация по прочности изготовления моделей:

- Первый класс (серийное производство и промодели)
- Второй класс (ограниченное число формовок)
- Третий класс (разовое литье)



a)



б)

Материал модели	Срок службы (число формовок)		Тип производств ,
	ручная формовка	машинная формовка	
Чугун	—	75000— 100000	Массовое и крупносерийное производство
Бронза и латунь	—	до 10000	Массовое производство
Алюминиевые сплавы	до 3000	25000—50 000	Массовое и серийное производство
Белые сплавы	до 300	до 2000	Мелкосерийное производство
Гипс	100—250	1000	То же
Цемент	350	1000	То же
Дерево	до 100	до 1000	Единичное и мелкосерийное производство

материал	преимущество	недостаток
<p>Сосна, ель, бук и др.</p> <p>Алюминиевые сплавы (ГОСТ2685—75):АЛ3В,АЛ7В, АЛ10В,АЛ14В,АЛ12(для крупных моделей)</p> <p>Серый чугун не ниже марки СЧ 15 (ГОСТ 1412—79)</p> <p>Сталь 15 — Сталь 50 (ГОСТ 1050—74)</p> <p>Бронза и латунь</p> <p>Свинцово-сурьмянистые сплавы (5% Zn, 15% Sb, остальное Pb или 15% Sb, 14% Bi, остальное Pb)</p> <p>Гипс кальцинированный или строительный: 50,% гипса, 50% воды</p> <p>Цемент: 50% цемента, 50% кварцевого песка</p> <p>Пластмассы: ЭД-20, ЭД-16 (ГОСТ 10587—76), акриловые самотвердеющие составы</p> <p>Пенополистирол</p>	<p>Хорошая обрабатываемость, низкая стоимость</p> <p>Хорошая обрабатываемость, антикоррозийность, низкая плотность</p> <p>Высокая прочность, хорошая обрабатываемость</p> <p>Высокая прочность и малая шероховатость обработанной поверхности</p> <p>Высокая прочность и малая шероховатость обработанной поверхности, неокисляемость</p> <p>Хорошая обрабатываемость</p> <p>Простота изготовления модельного комплекта, низкая стоимость</p> <p>Простота изготовления модельного комплекта</p> <p>Высокая прочность, простота изготовления модельного комплекта, не требующая, практически, обработки резанием</p> <p>Простота изготовления модельного комплекта, низкая плотность</p>	<p>Склонность к деформации (коробление, усушка), низкая прочность</p> <p>Низкая прочность и высокая стоимость</p> <p>Склонность к коррозии, высокая плотность</p> <p>Склонность к коррозии, высокая плотность</p> <p>Большая плотность и высокая стоимость</p> <p>Большая плотность и высокая стоимость, низкая прочность</p> <p>Высокая шероховатость обработанной поверхности, низкая прочность</p> <p>То же</p> <p>Токсичность</p> <p>Разовое использование (газифицируются)</p>

1. При ручной формовке количество разъемов формы и модели не ограничено.

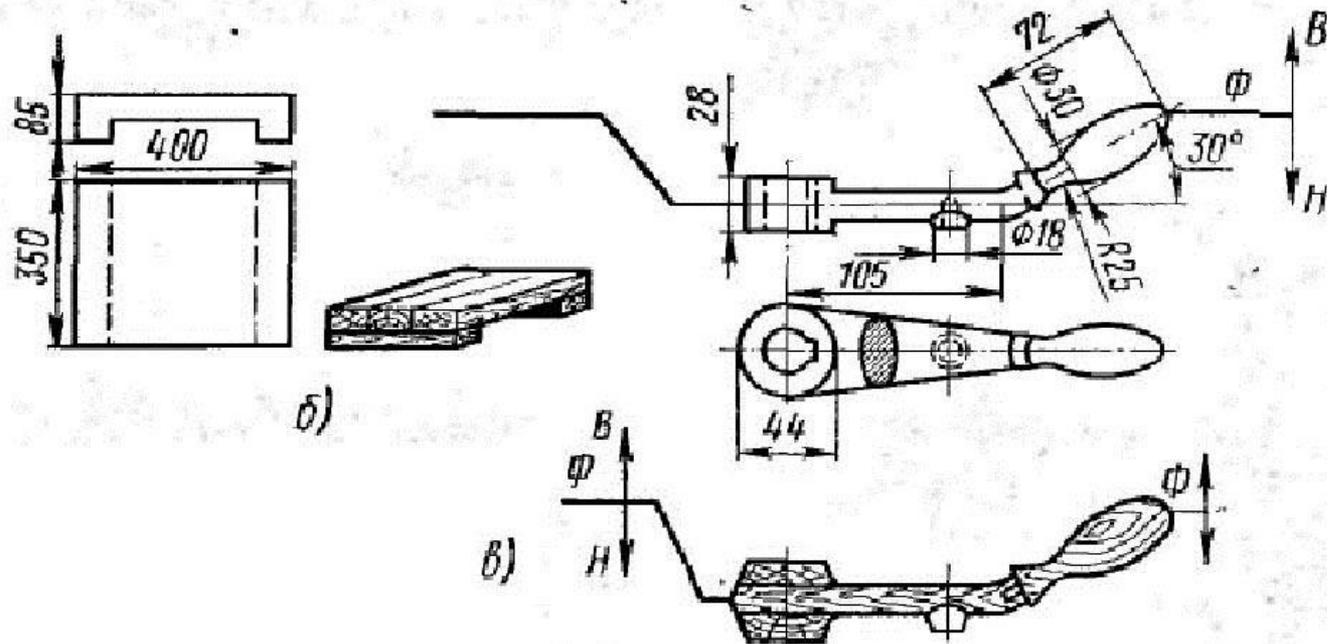
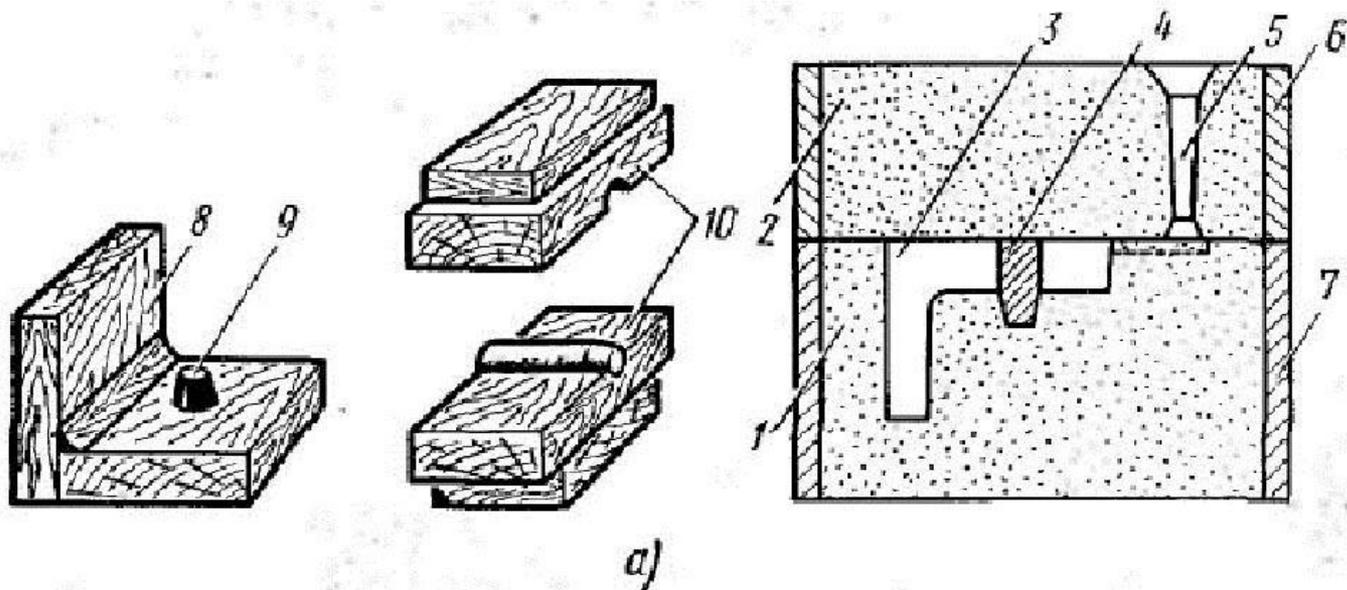
2. Количество стержней, а в модельном комплекте — стержневых ящиков сокращается до минимума.

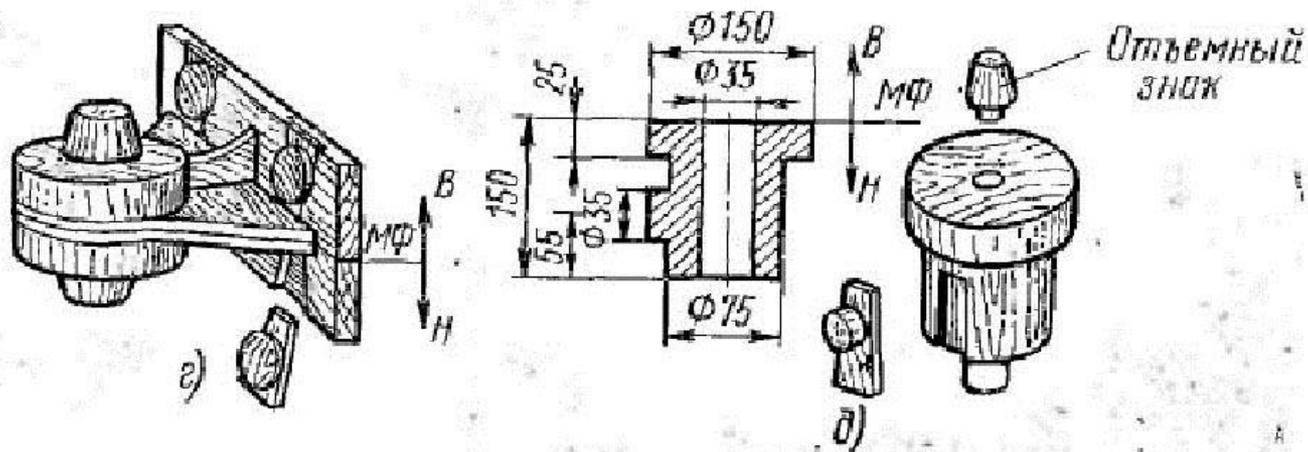
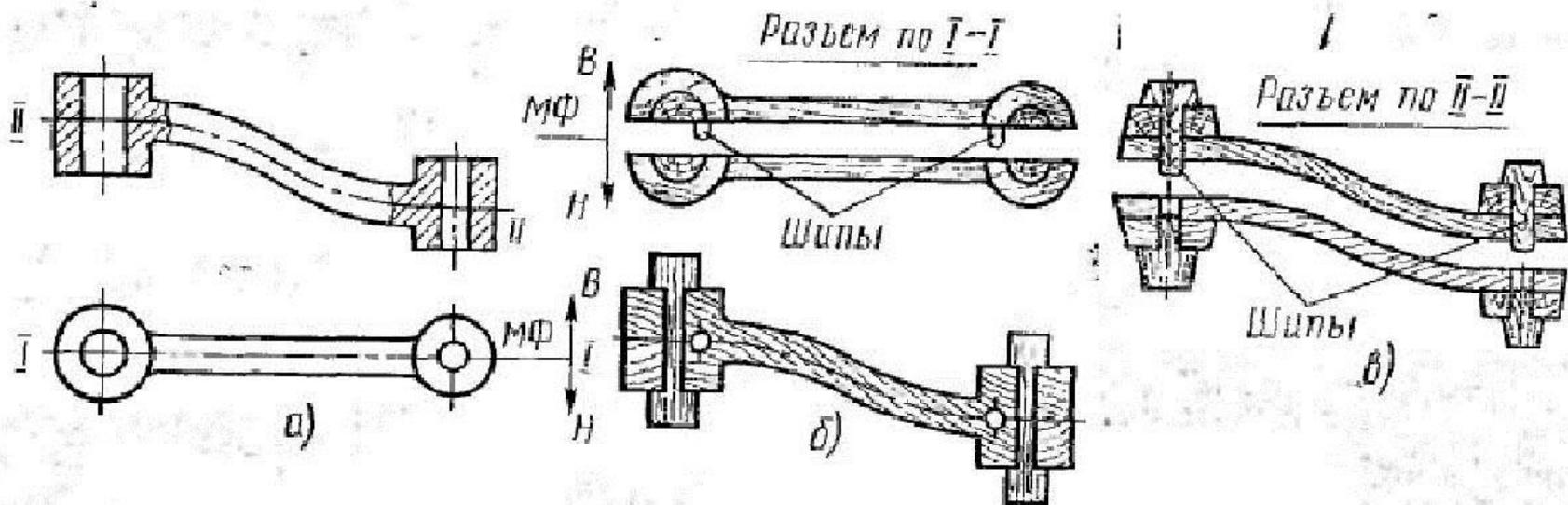
3. Боковые выступающие части, независимо от их размеров, если они не вынимаются из формы вместе с моделью, делаются отъемными, а крепление их к модели производится различными способами: на шпонках, шпильках и болтах и т. д.

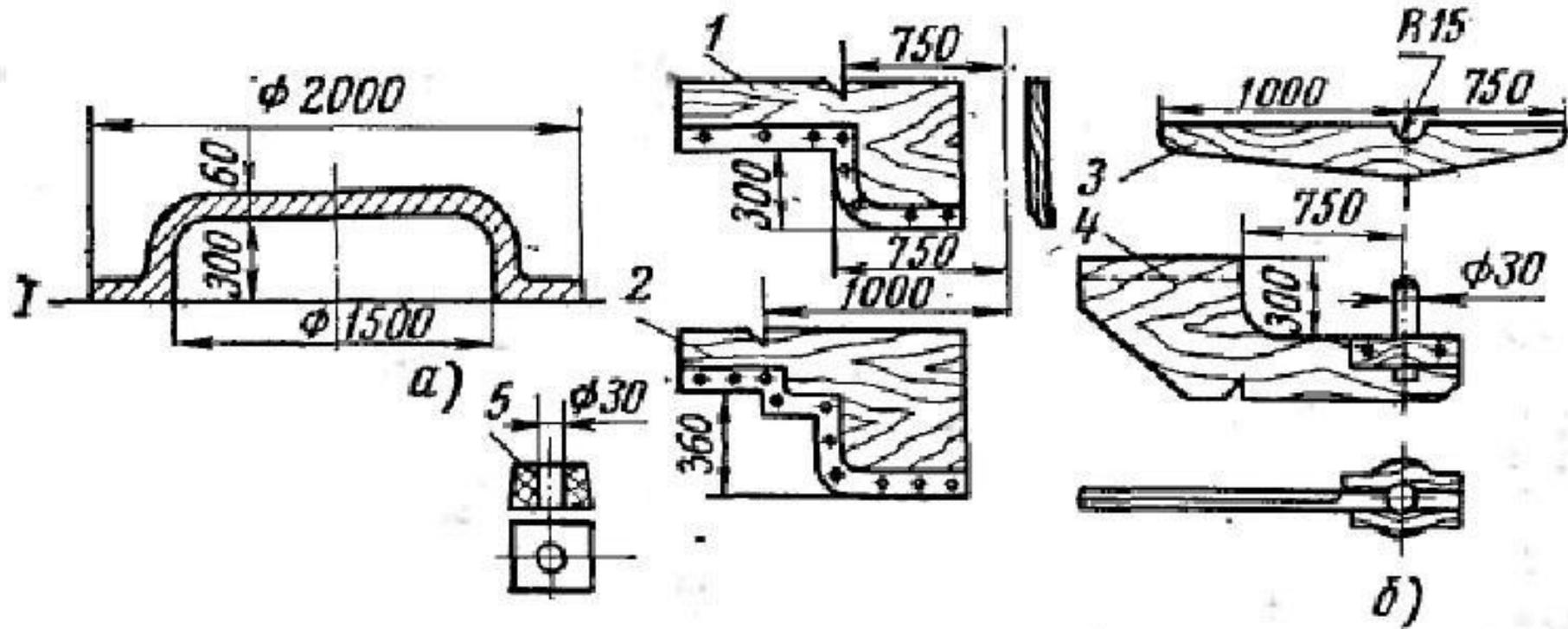
4. На моделях, формуемых в почве, необходимо делать окна для подбивки формы под моделью.

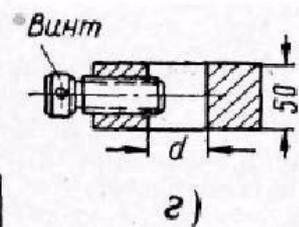
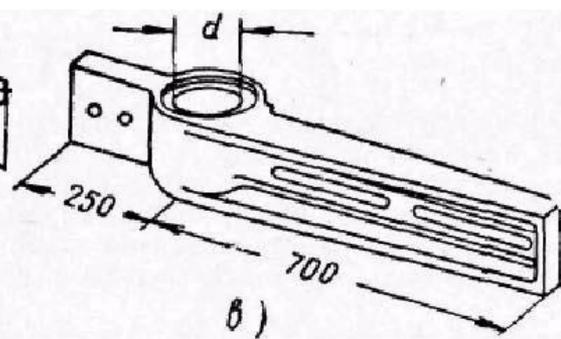
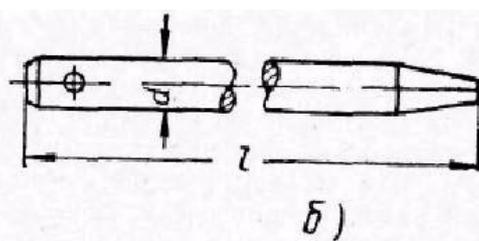
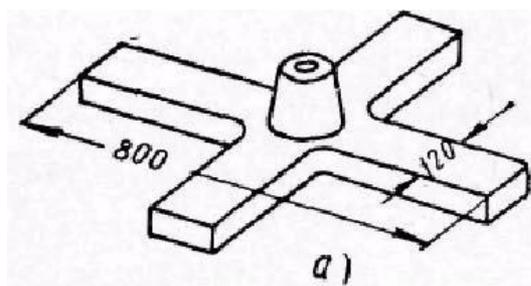
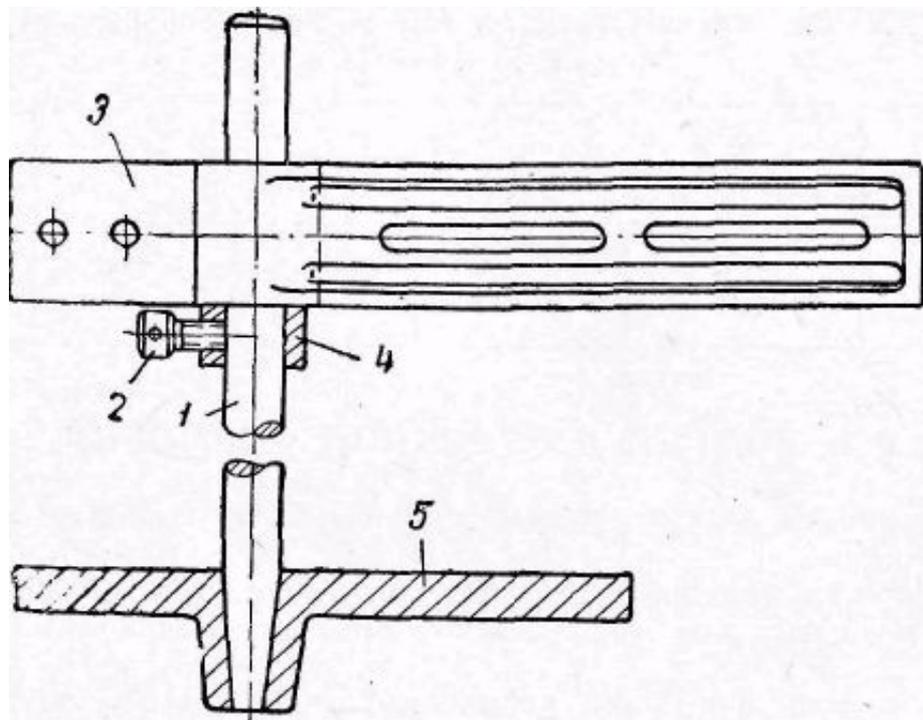
5. Возможность подрезки форм и снятие их кусками до выемки модели из формы упрощает изготовление модели.

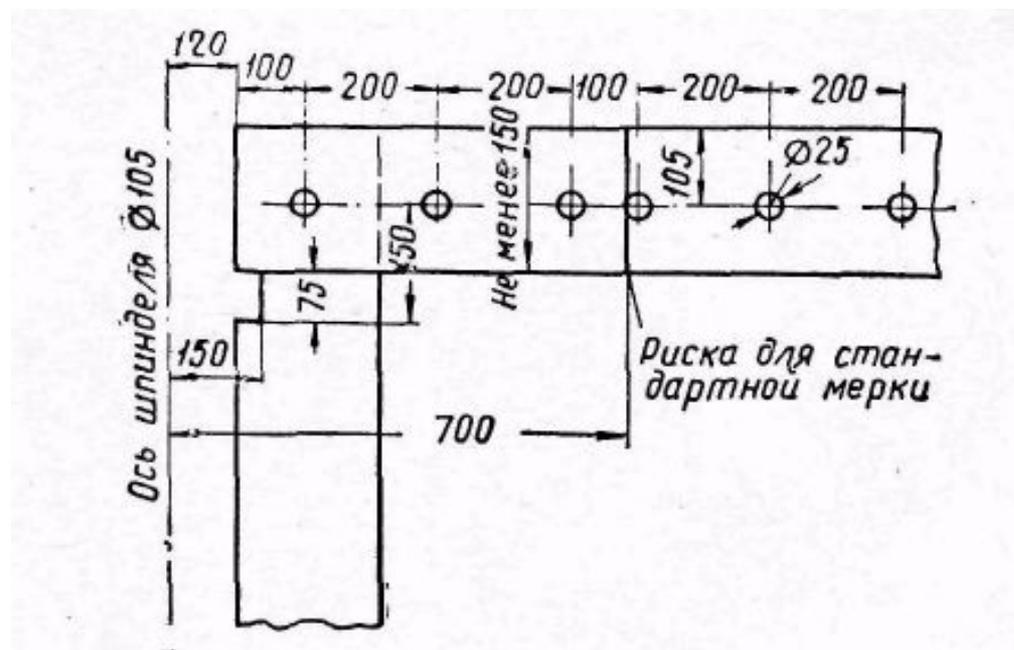
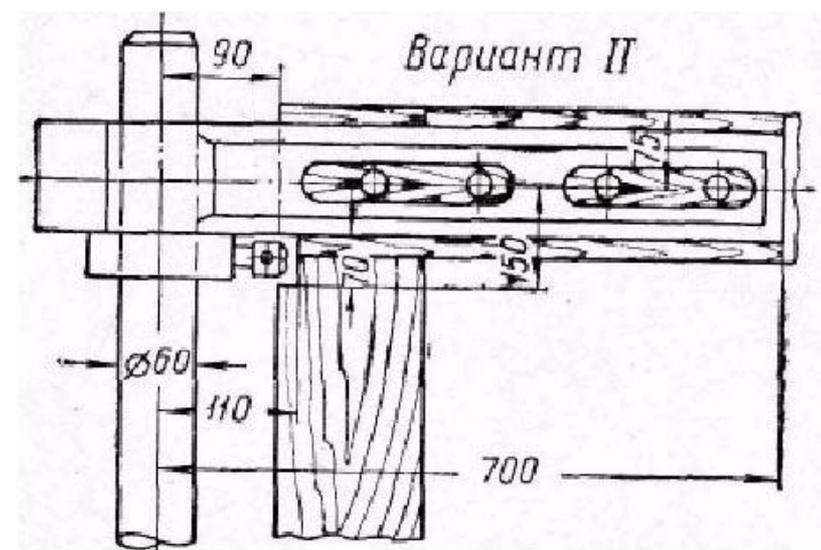
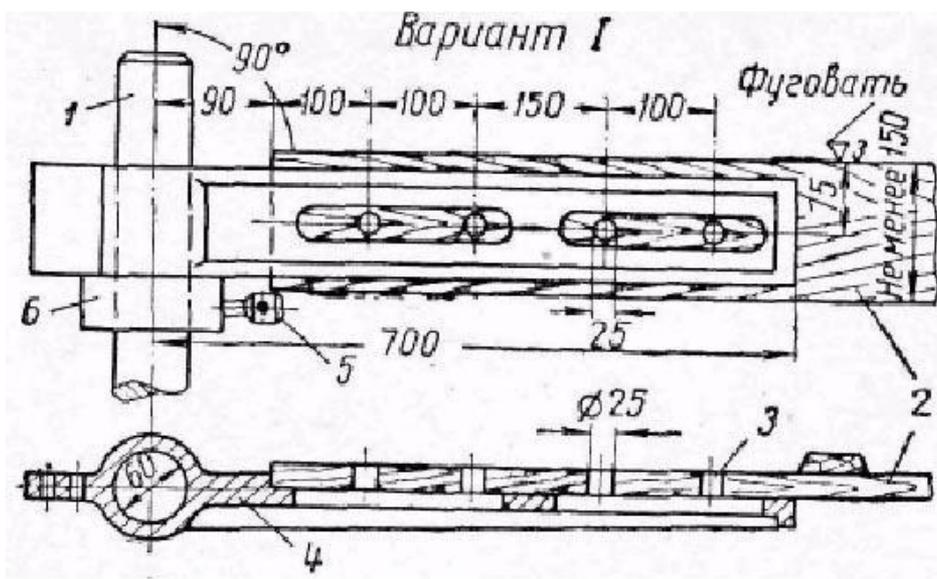
6. Все модели ручной формовки должны иметь приспособления для расталкивания и удаления модели из формы.

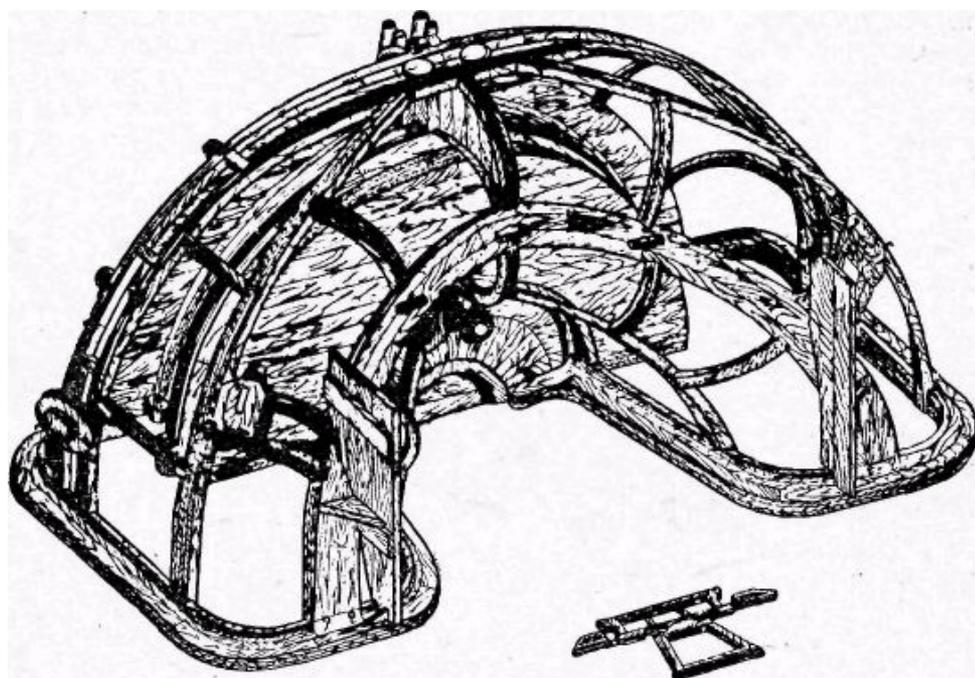
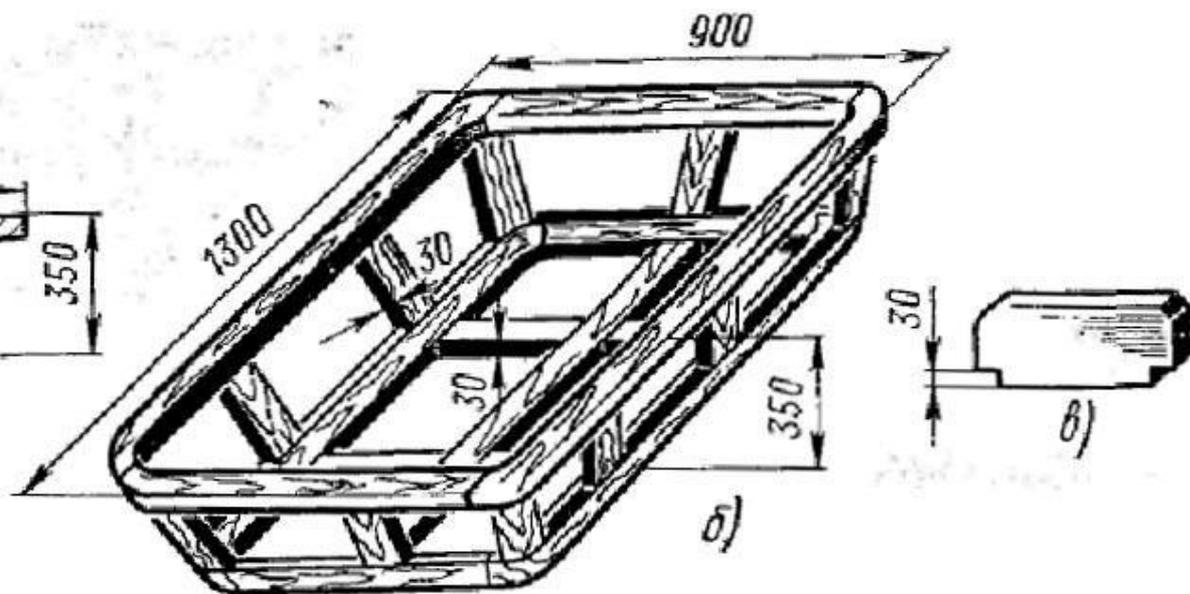
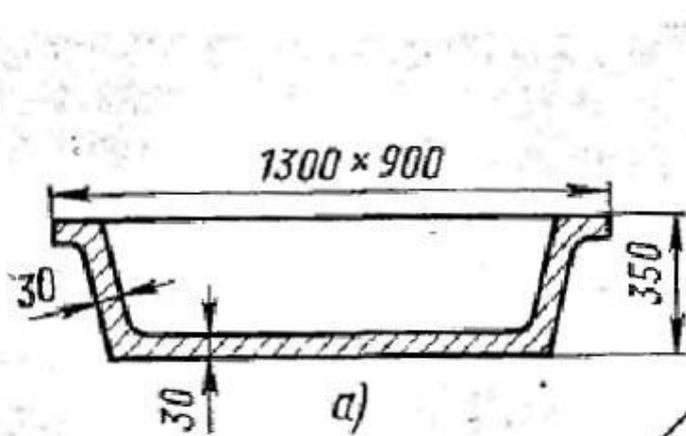


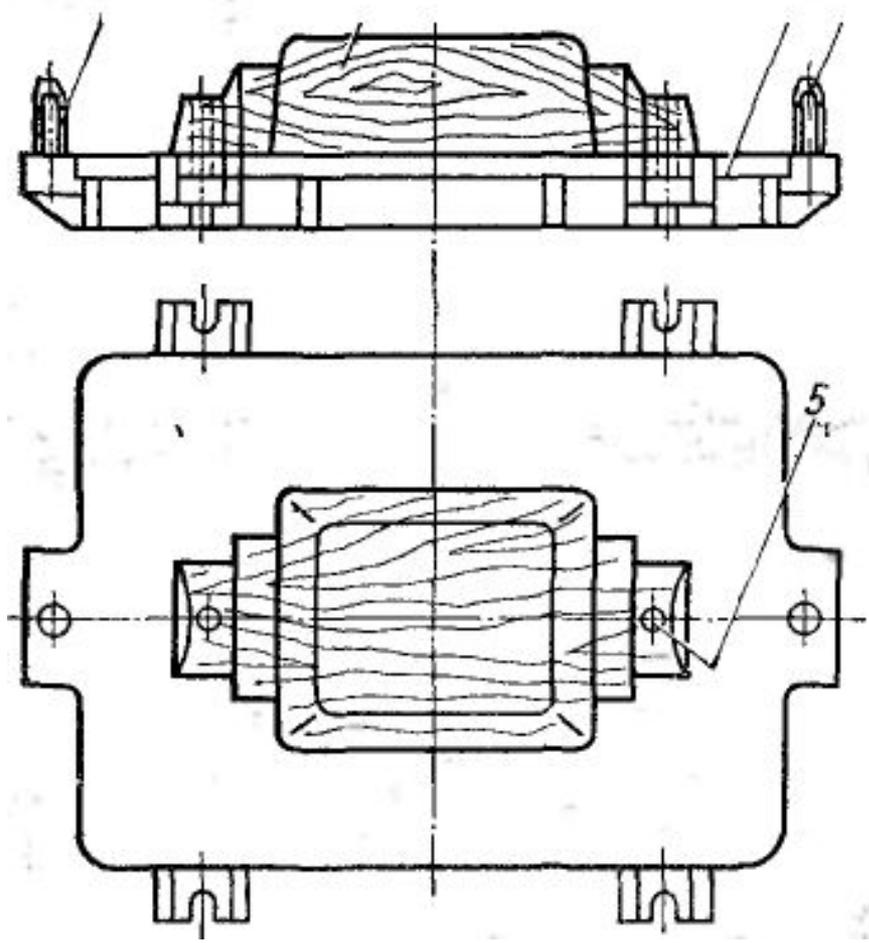


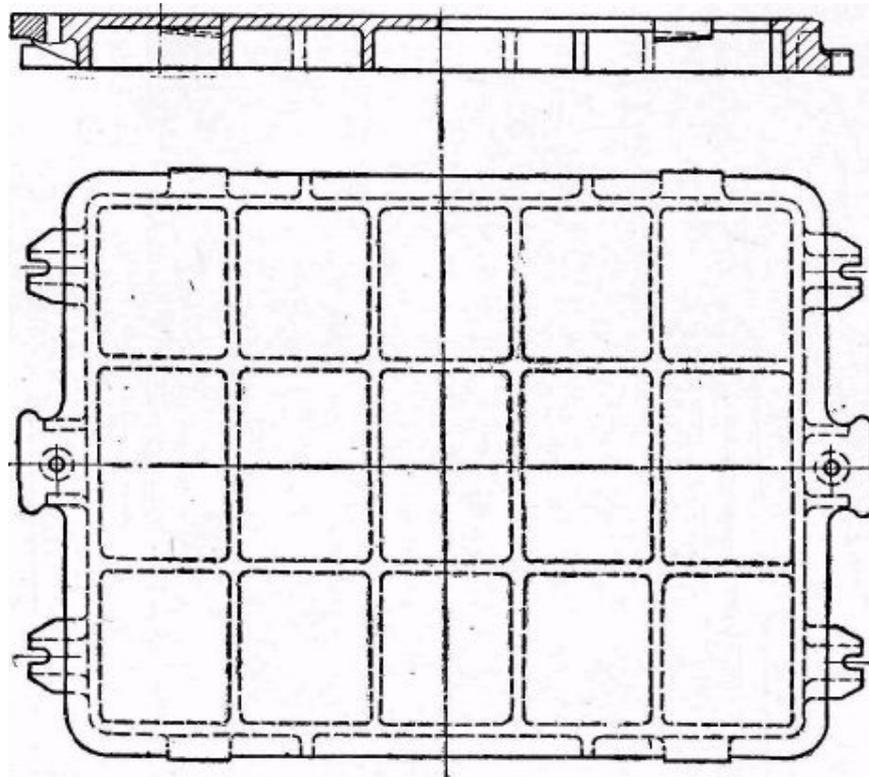
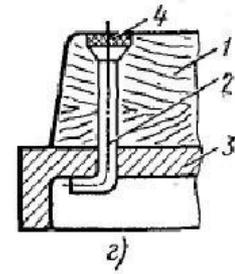
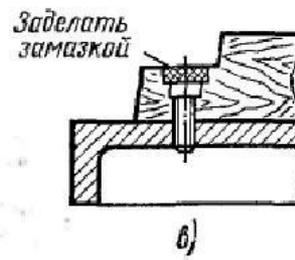
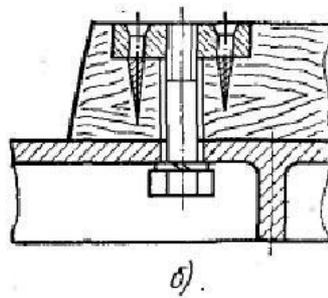
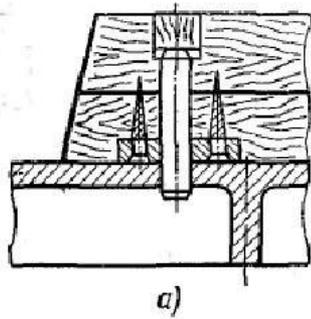


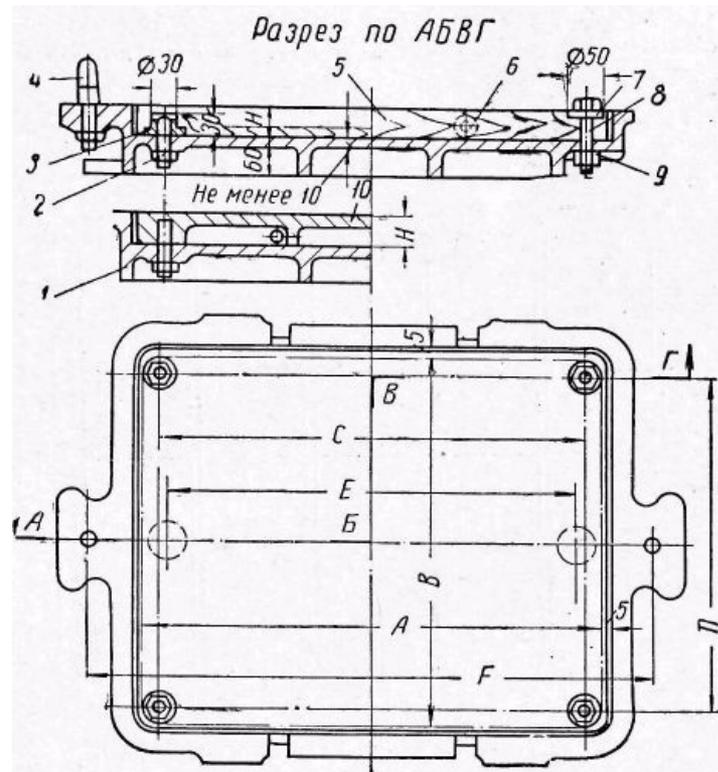
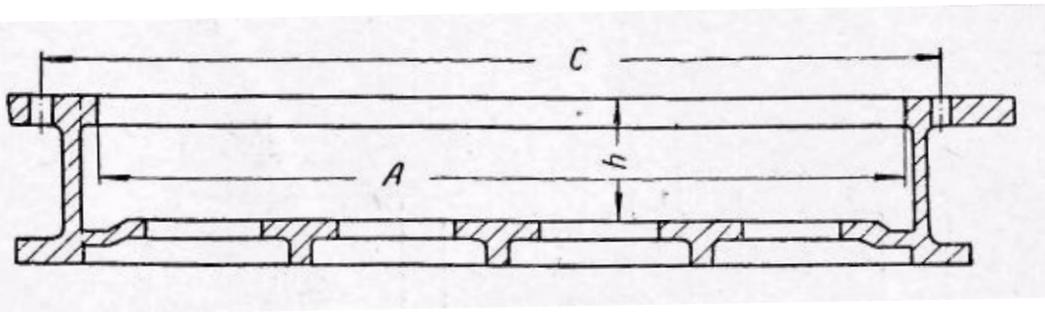


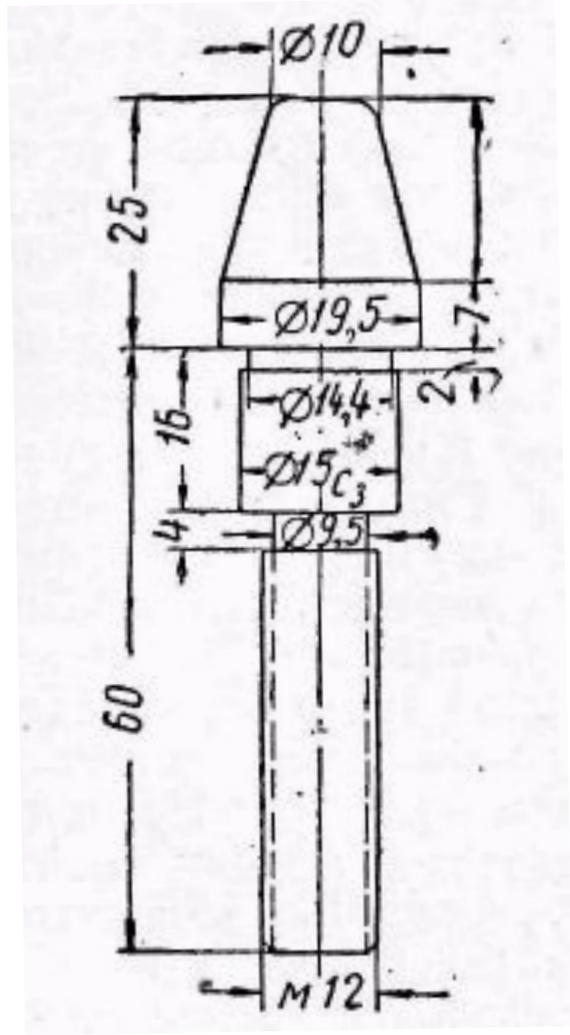
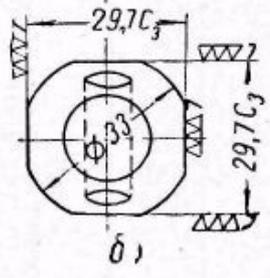
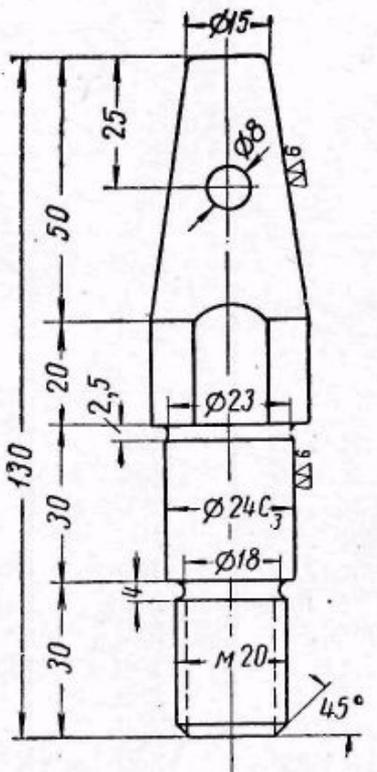
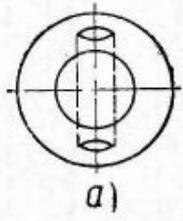
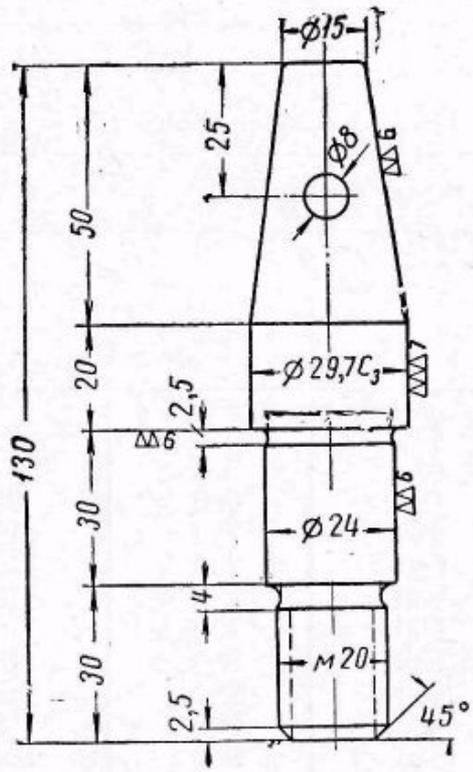


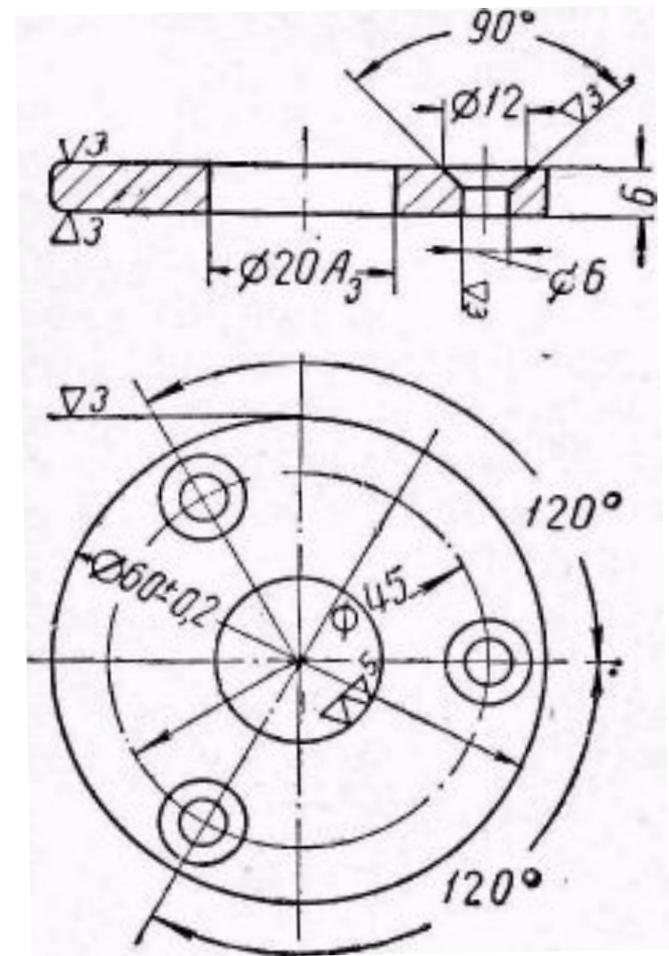
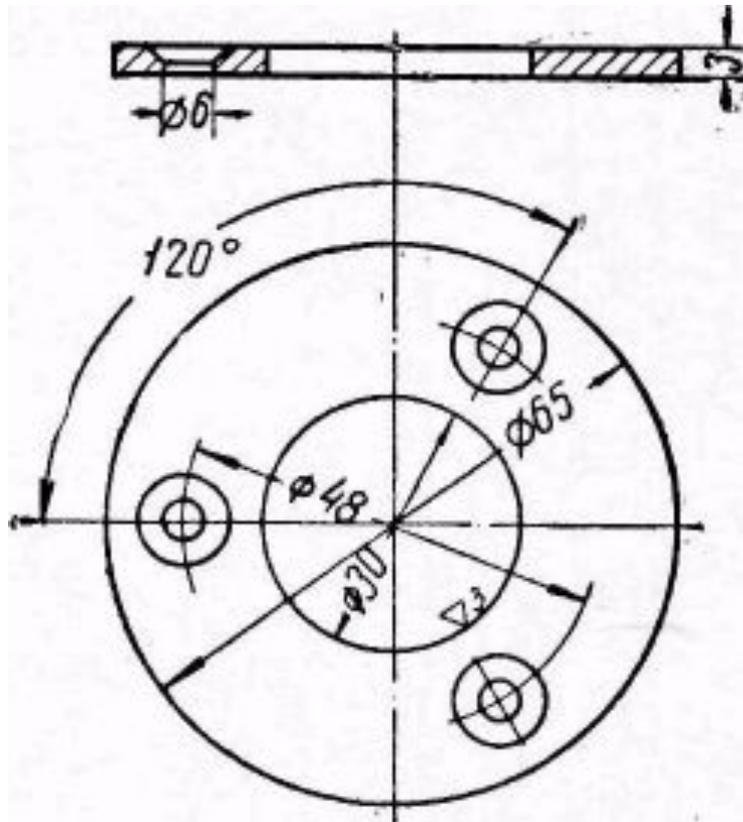


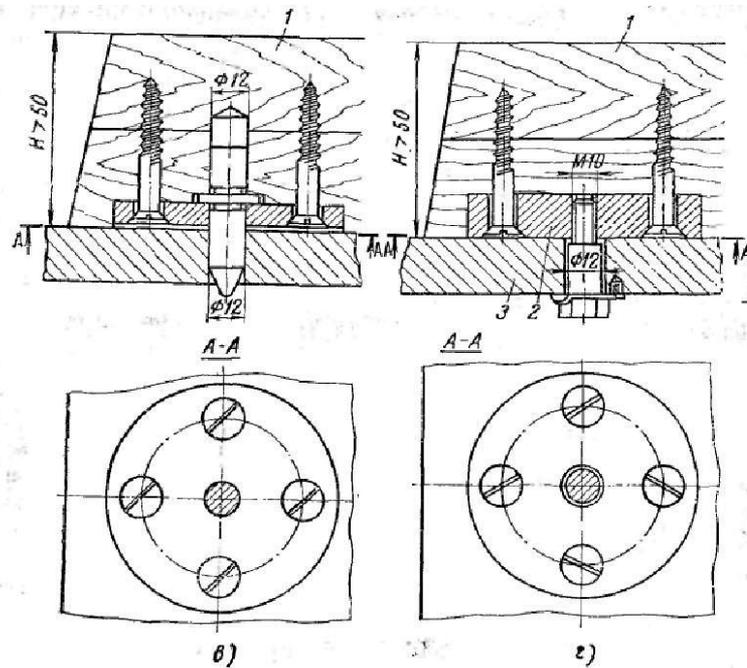
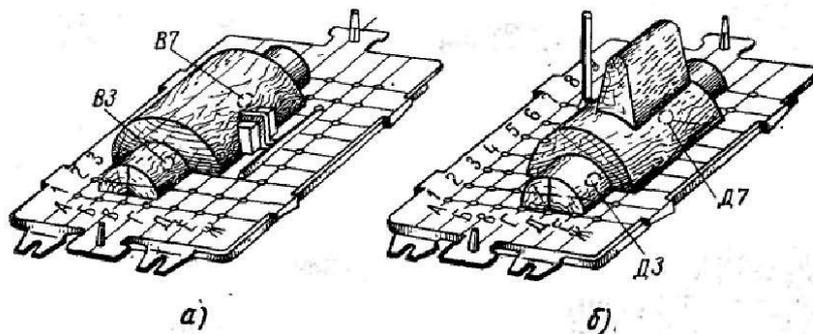
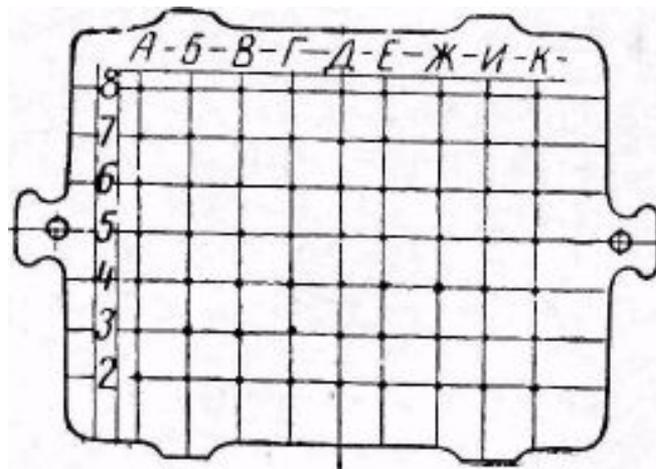


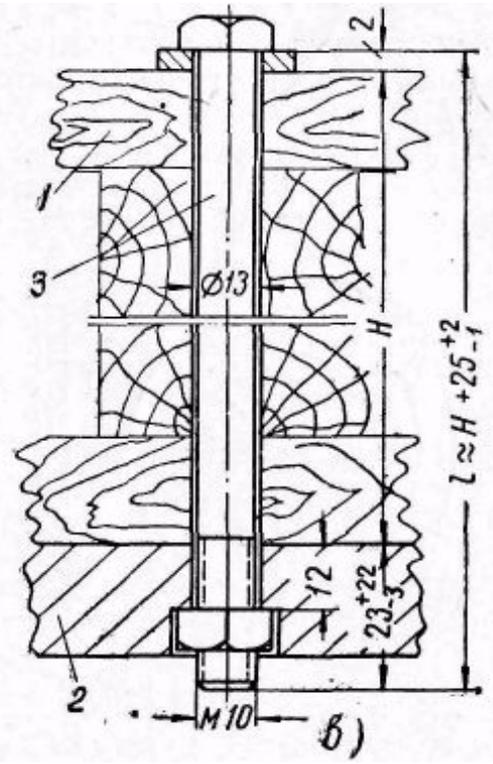
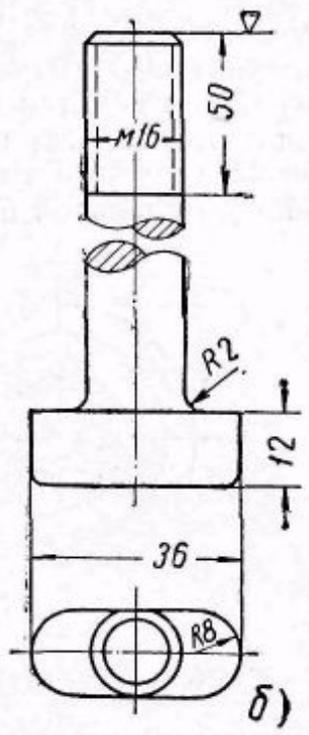
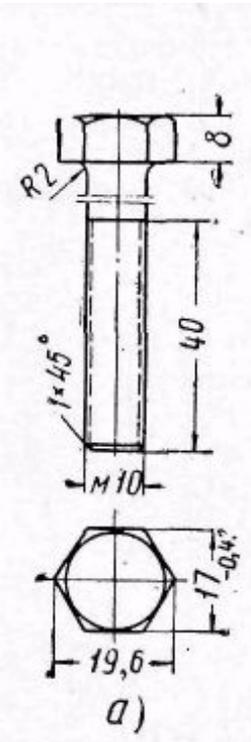
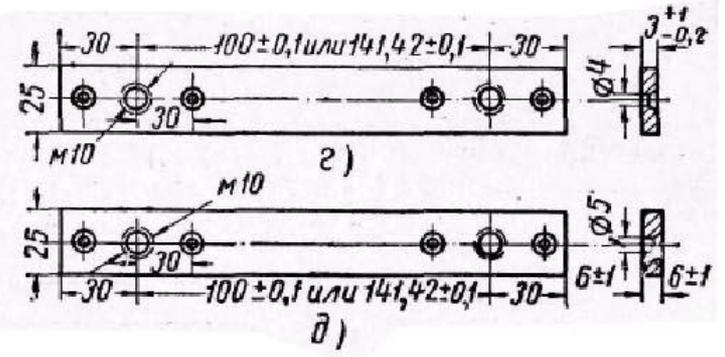
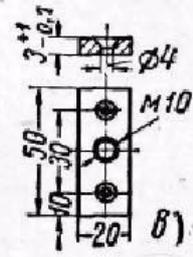
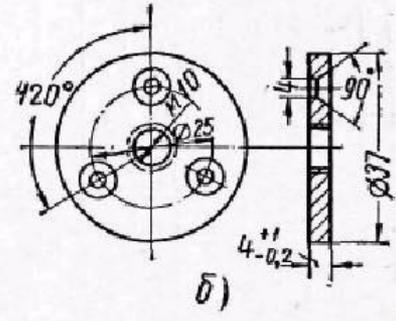
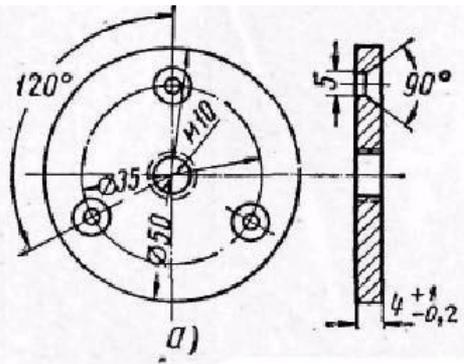


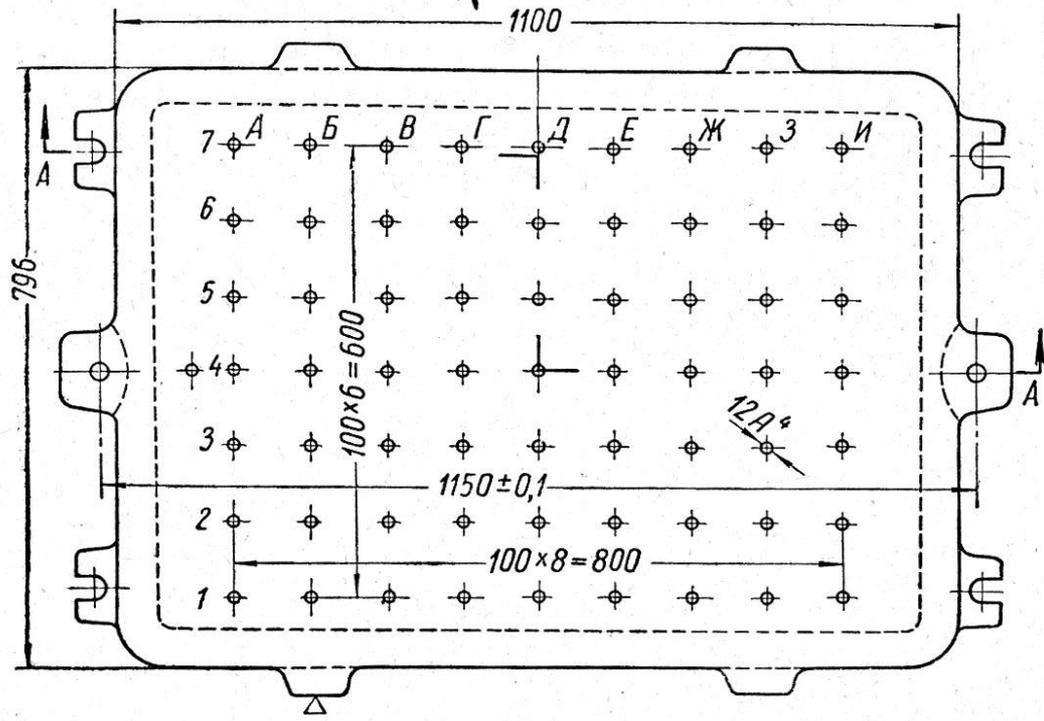
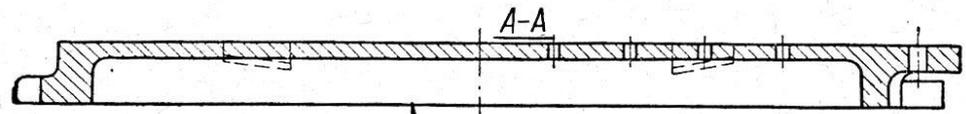
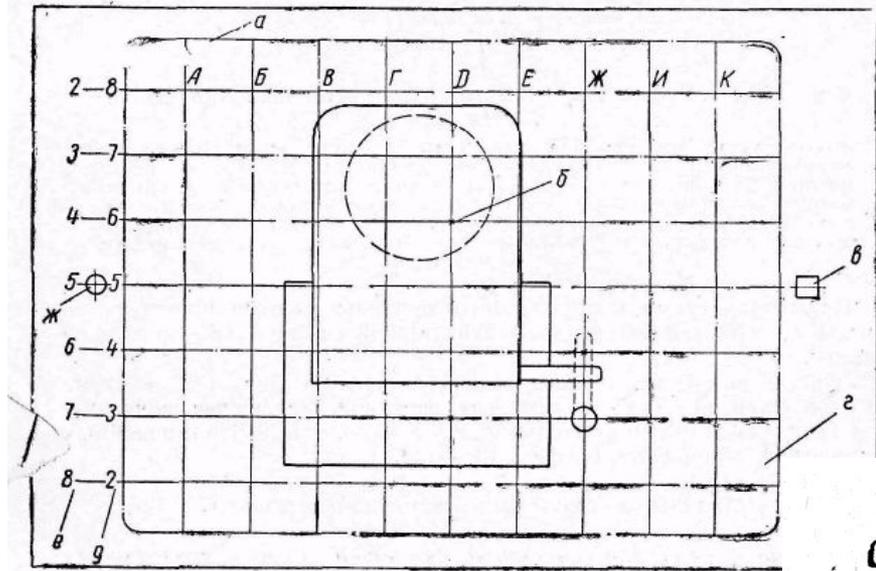




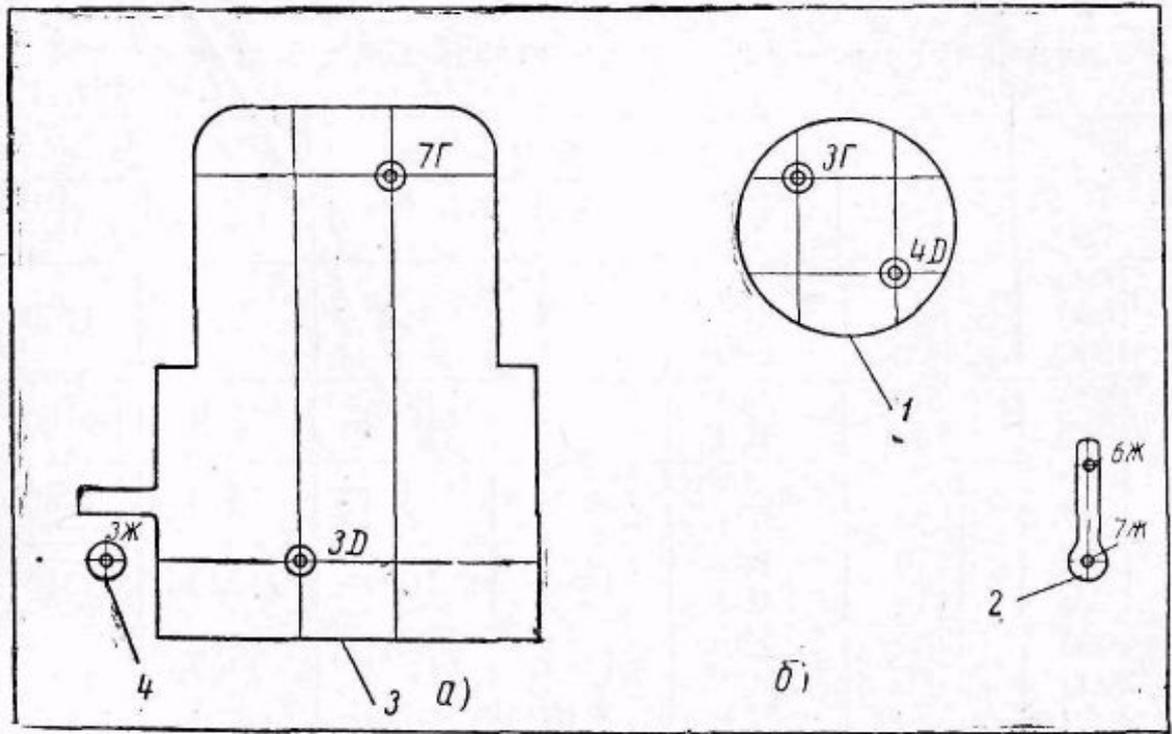


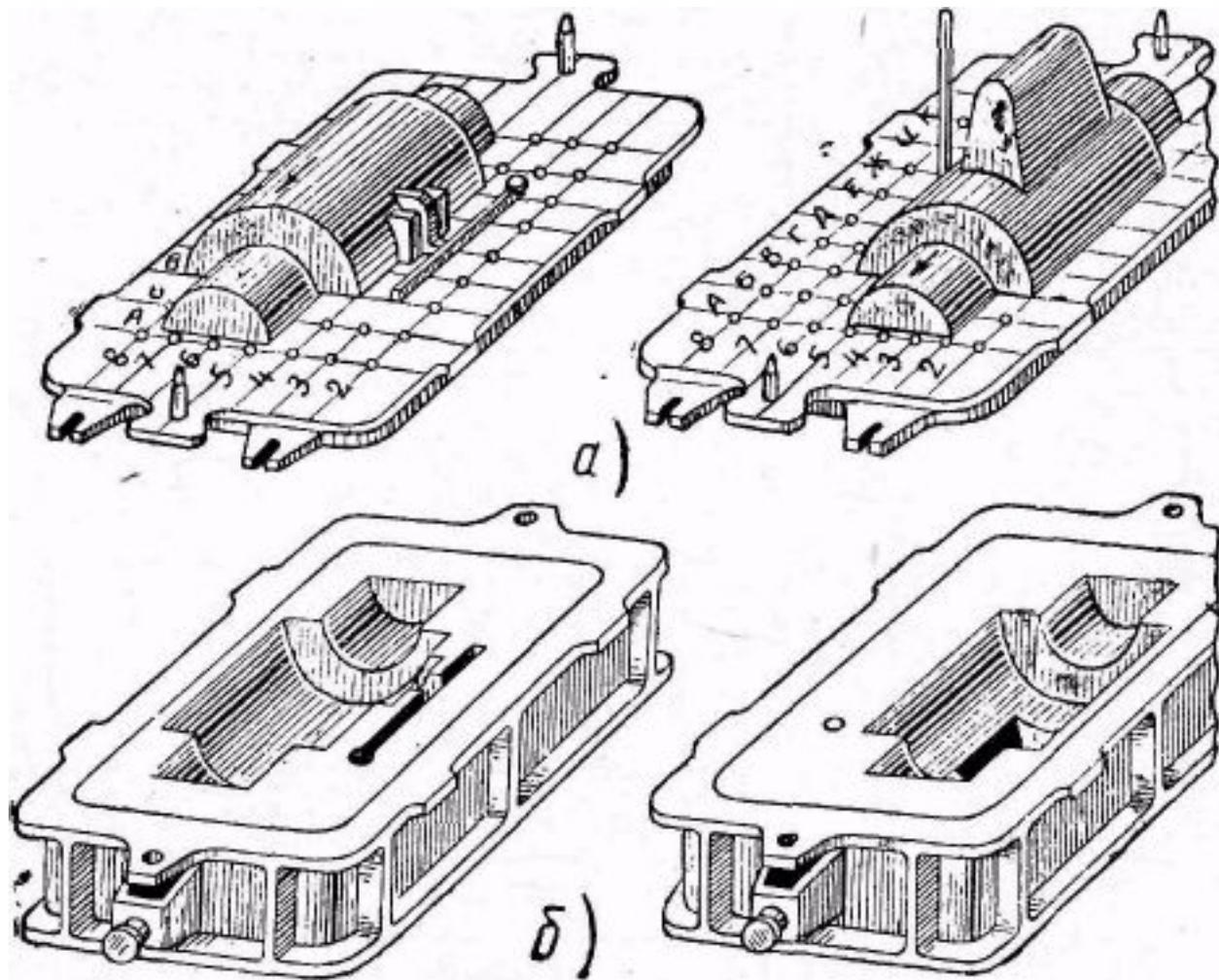


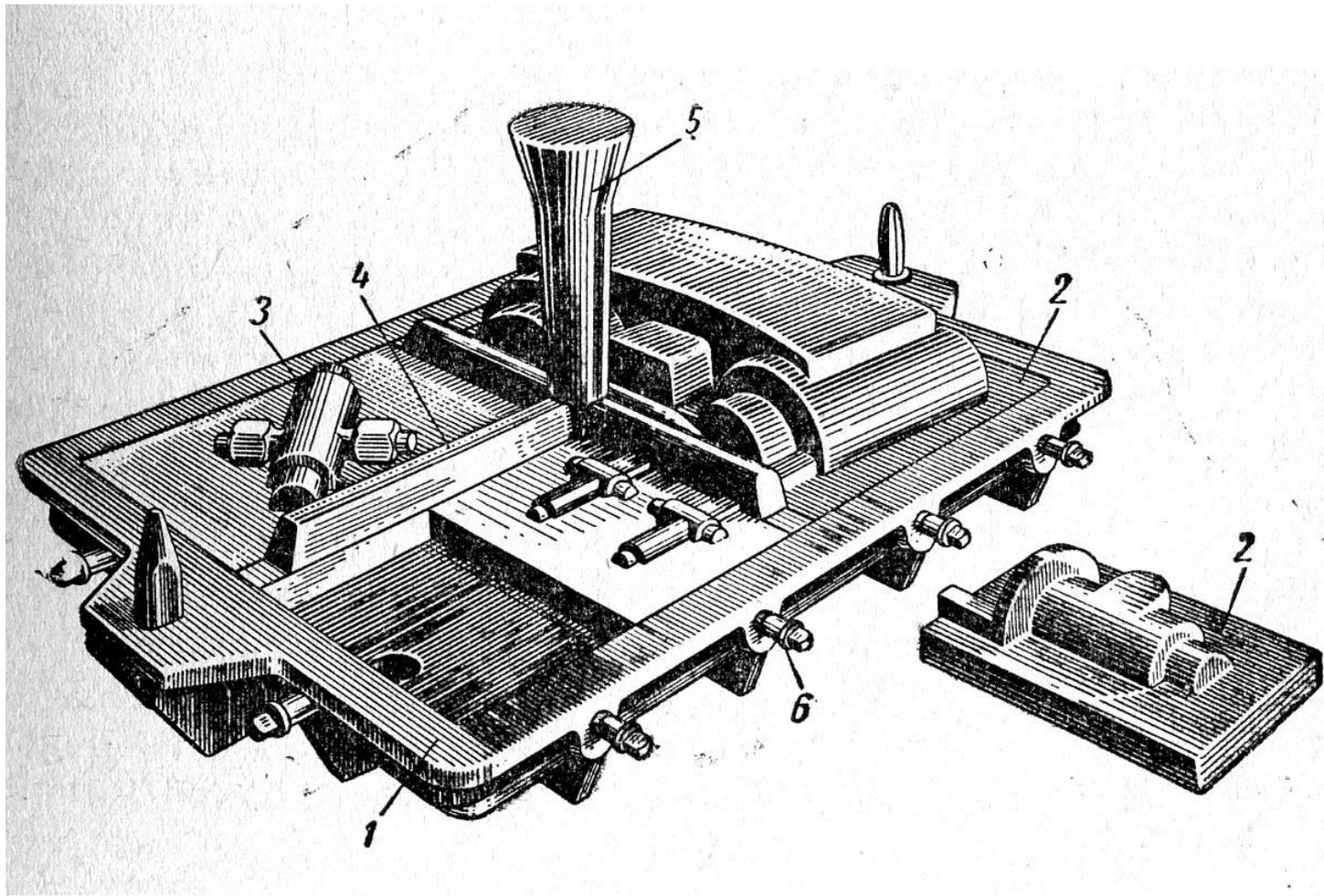


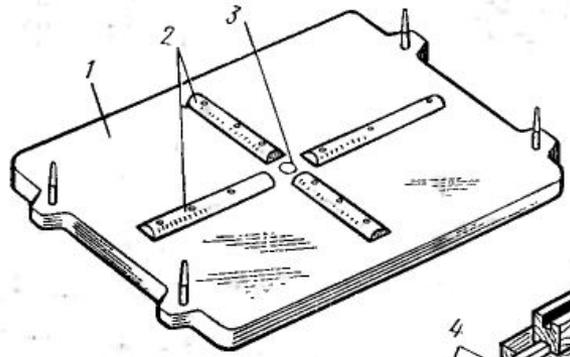


Координатная модельная плита.

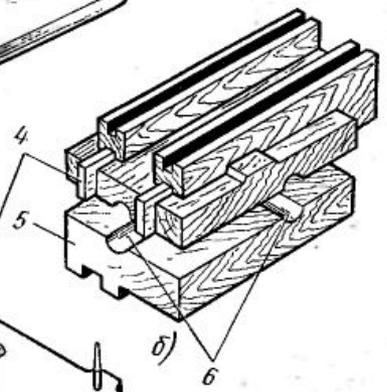




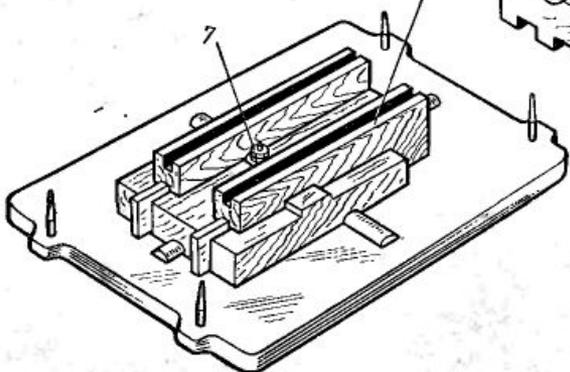




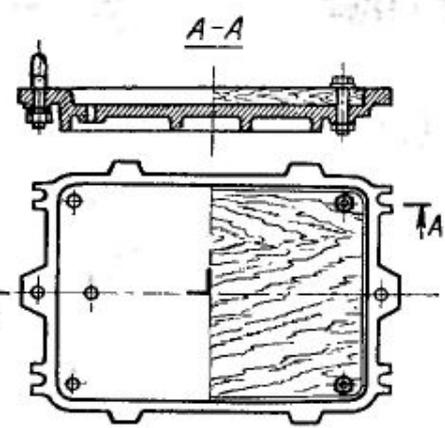
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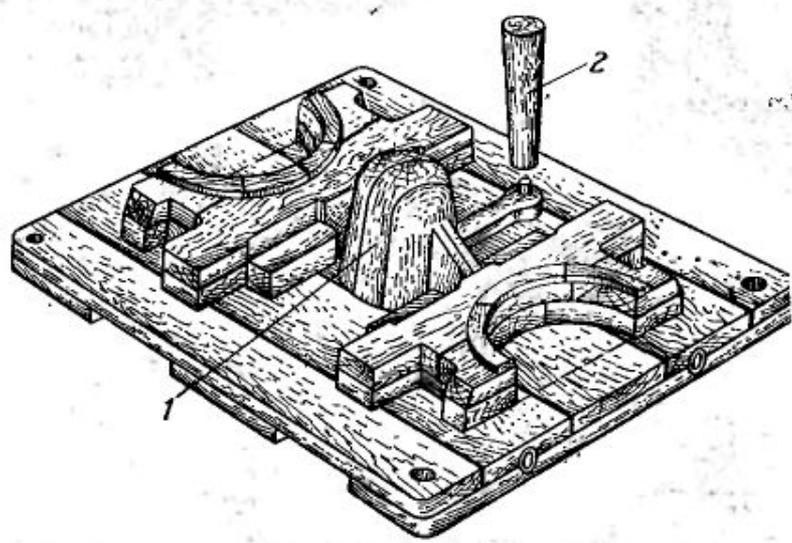
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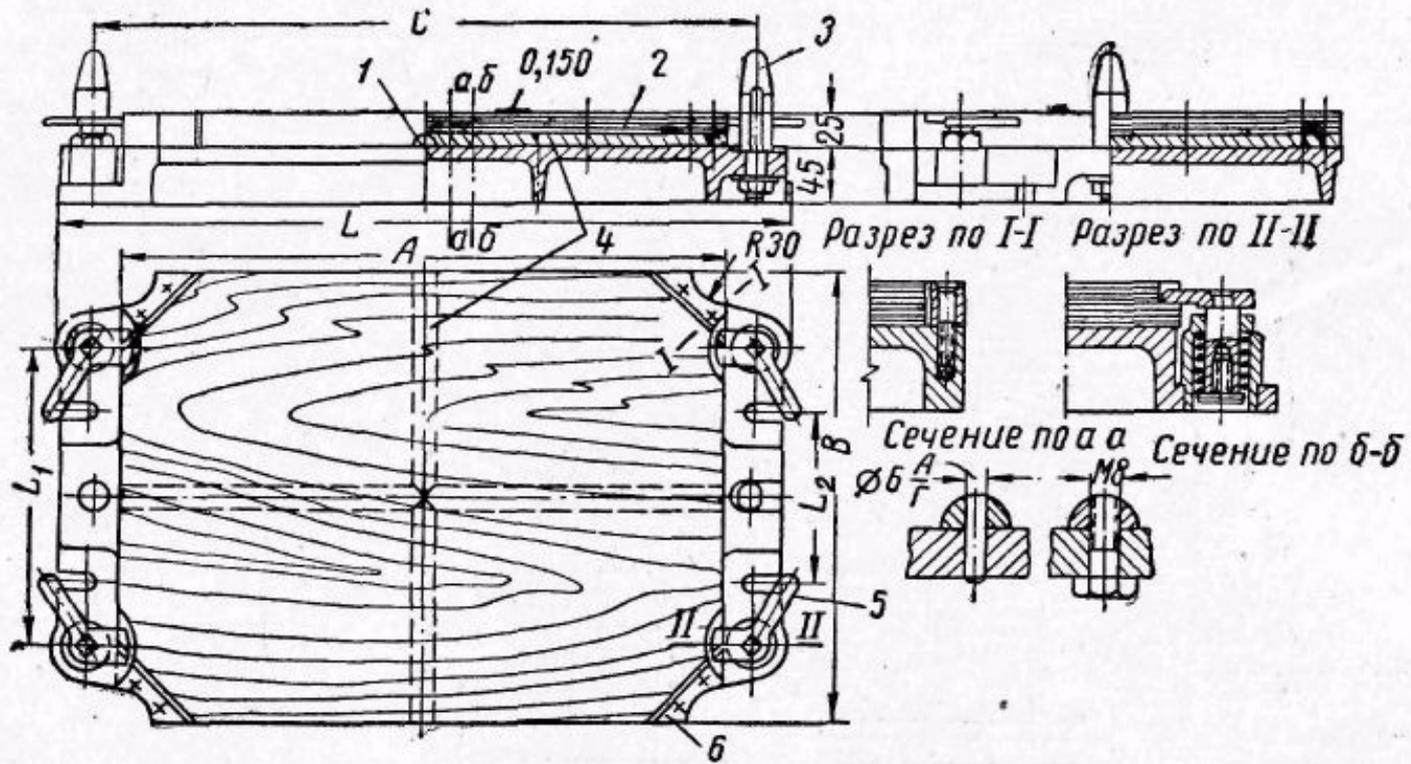
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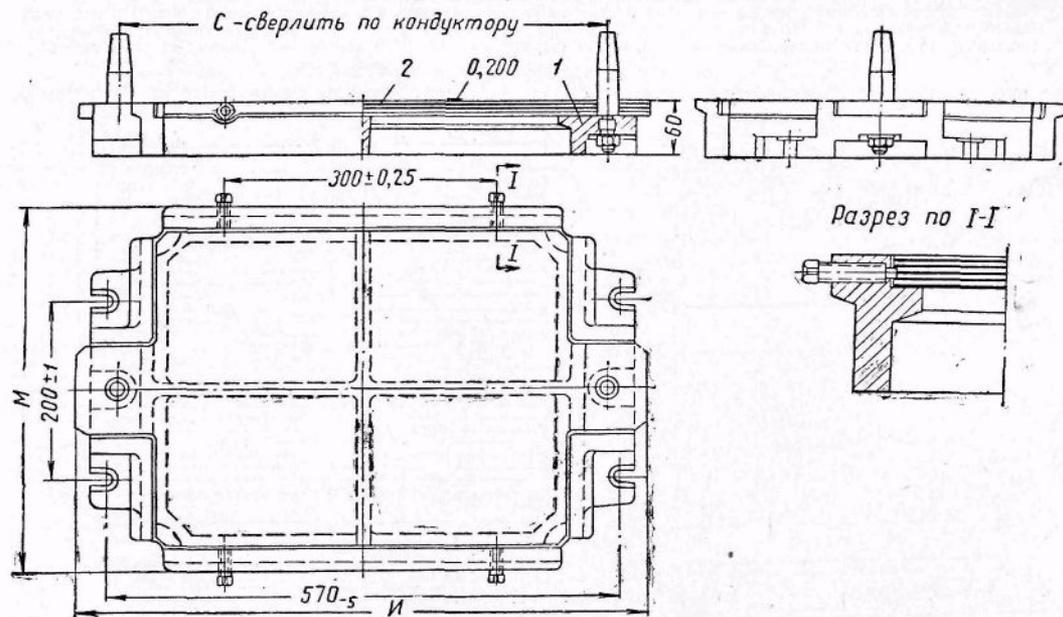
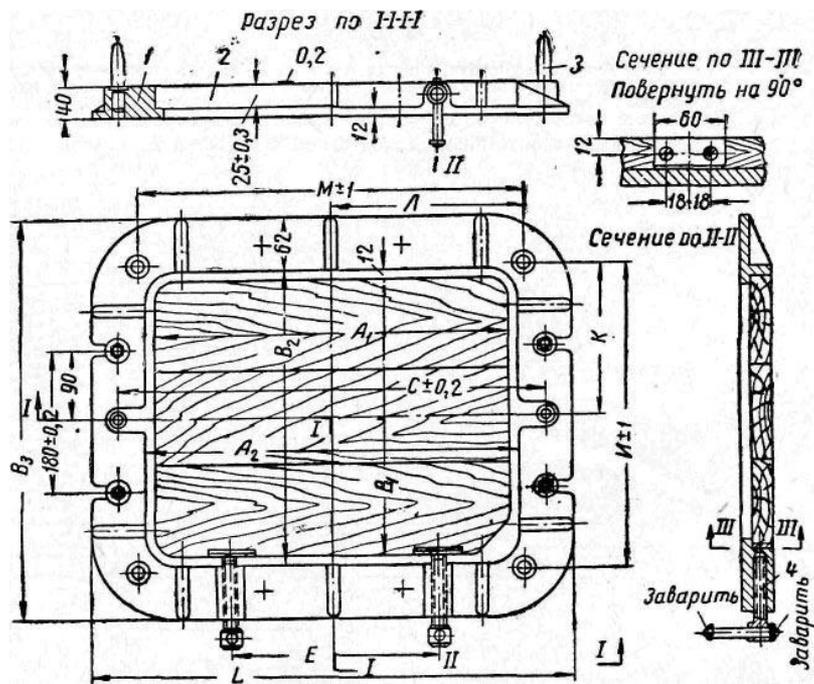


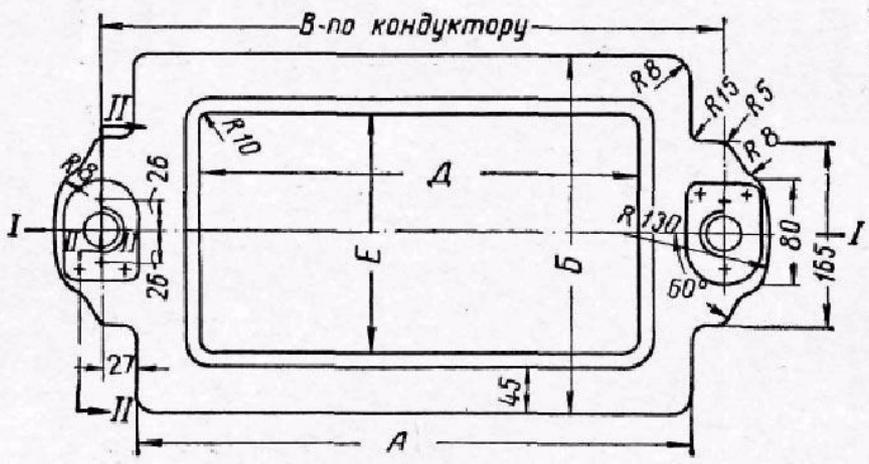
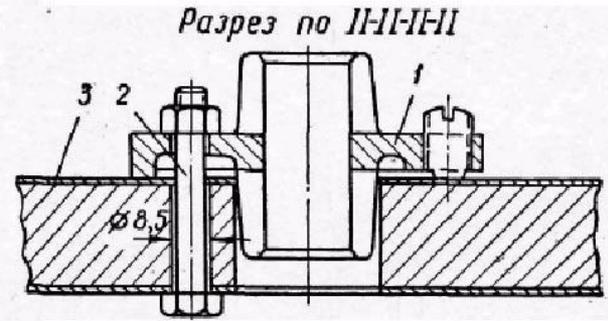
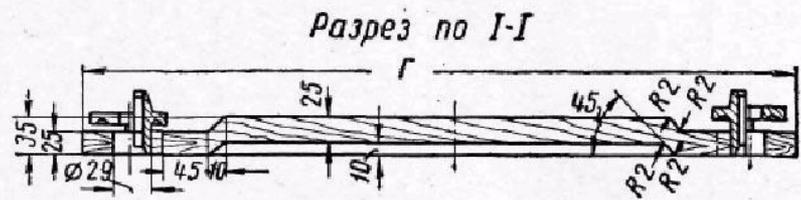
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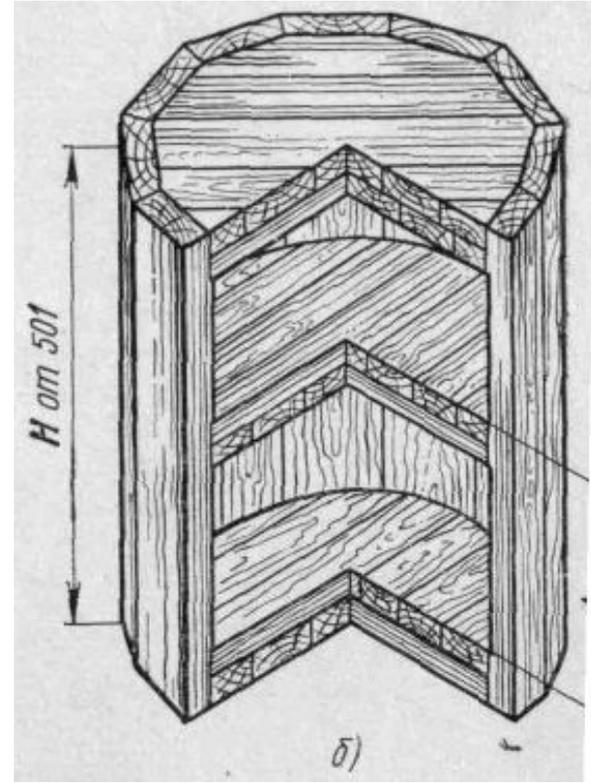
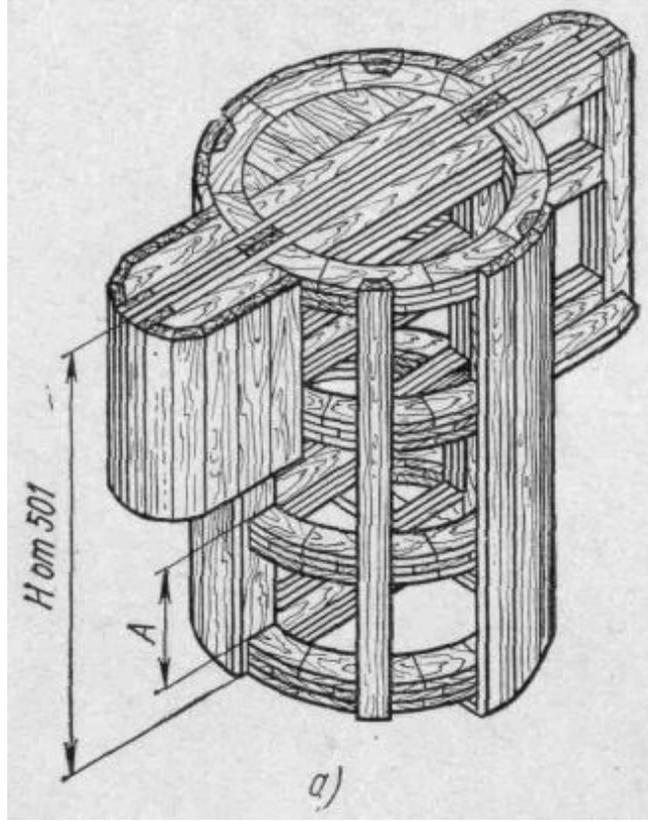


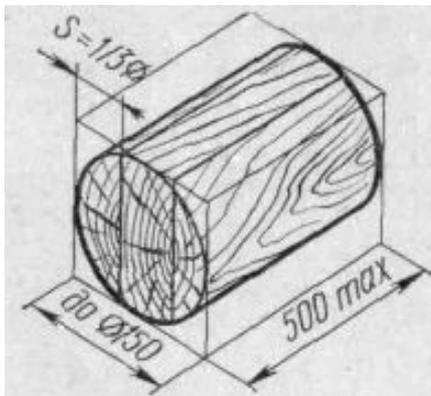
e)



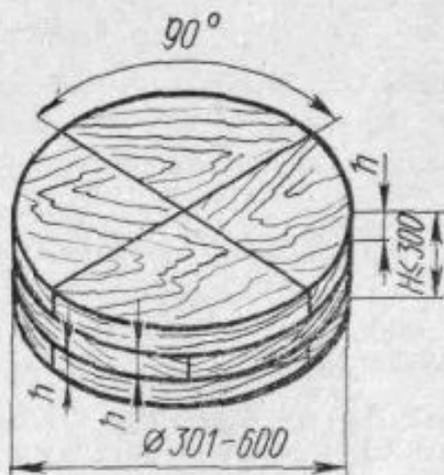




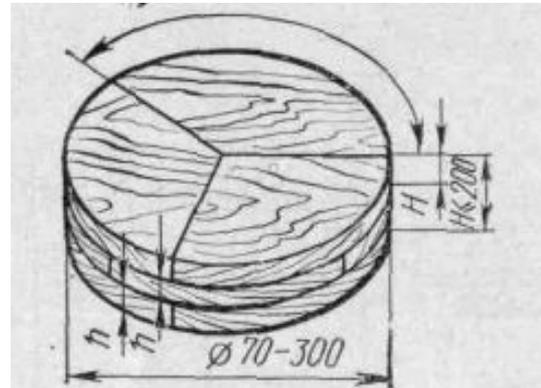




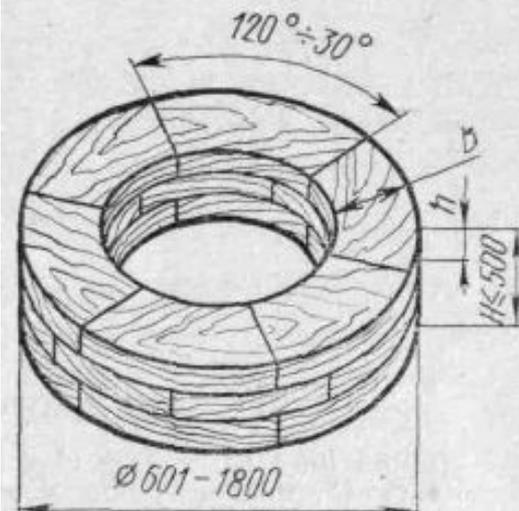
a)

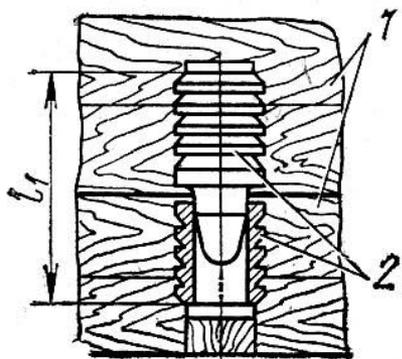


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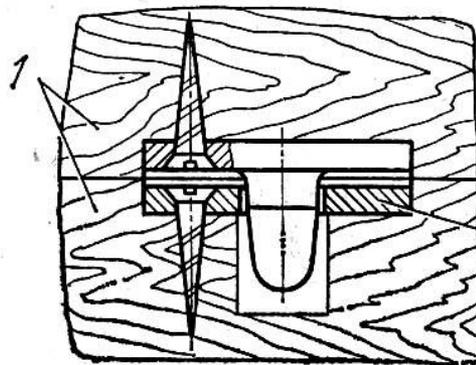


в)

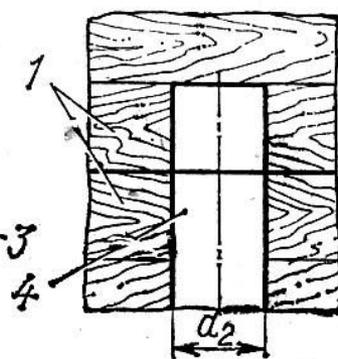




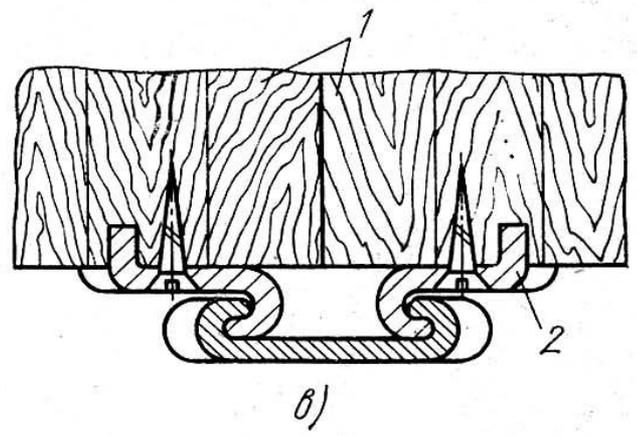
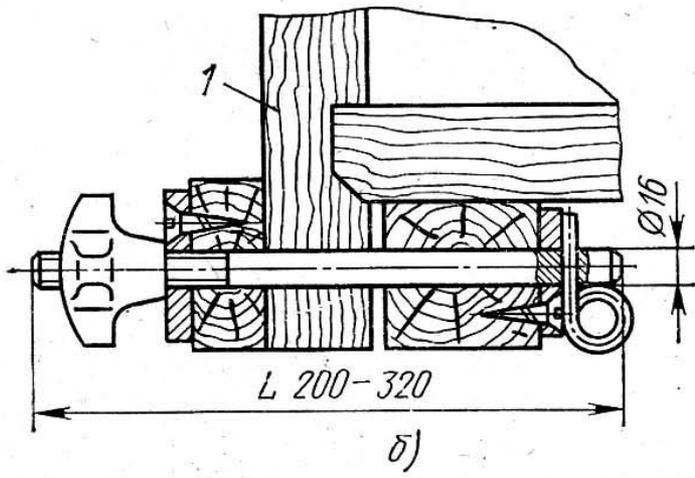
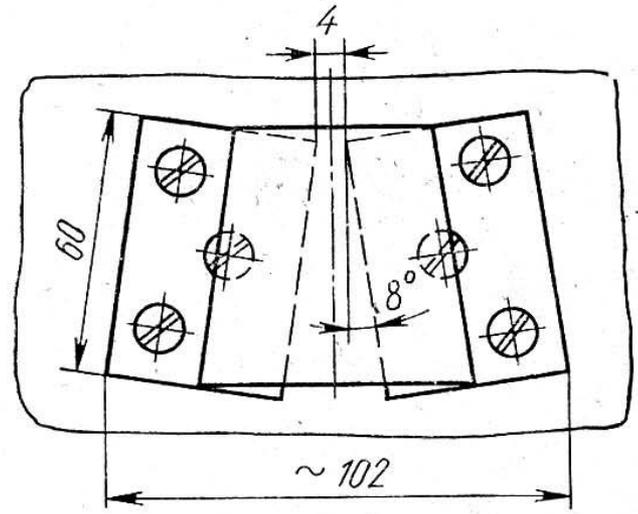
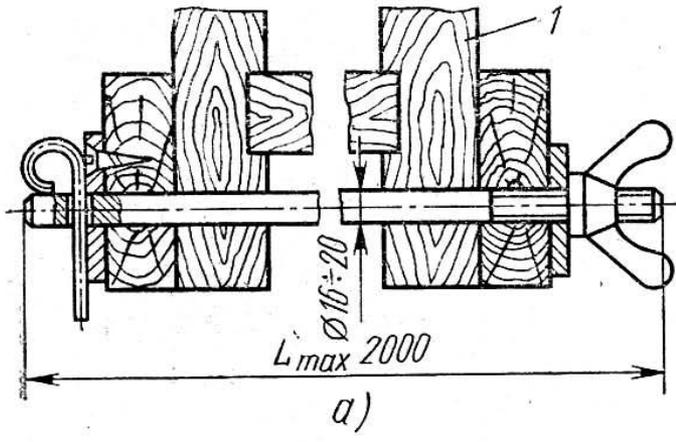
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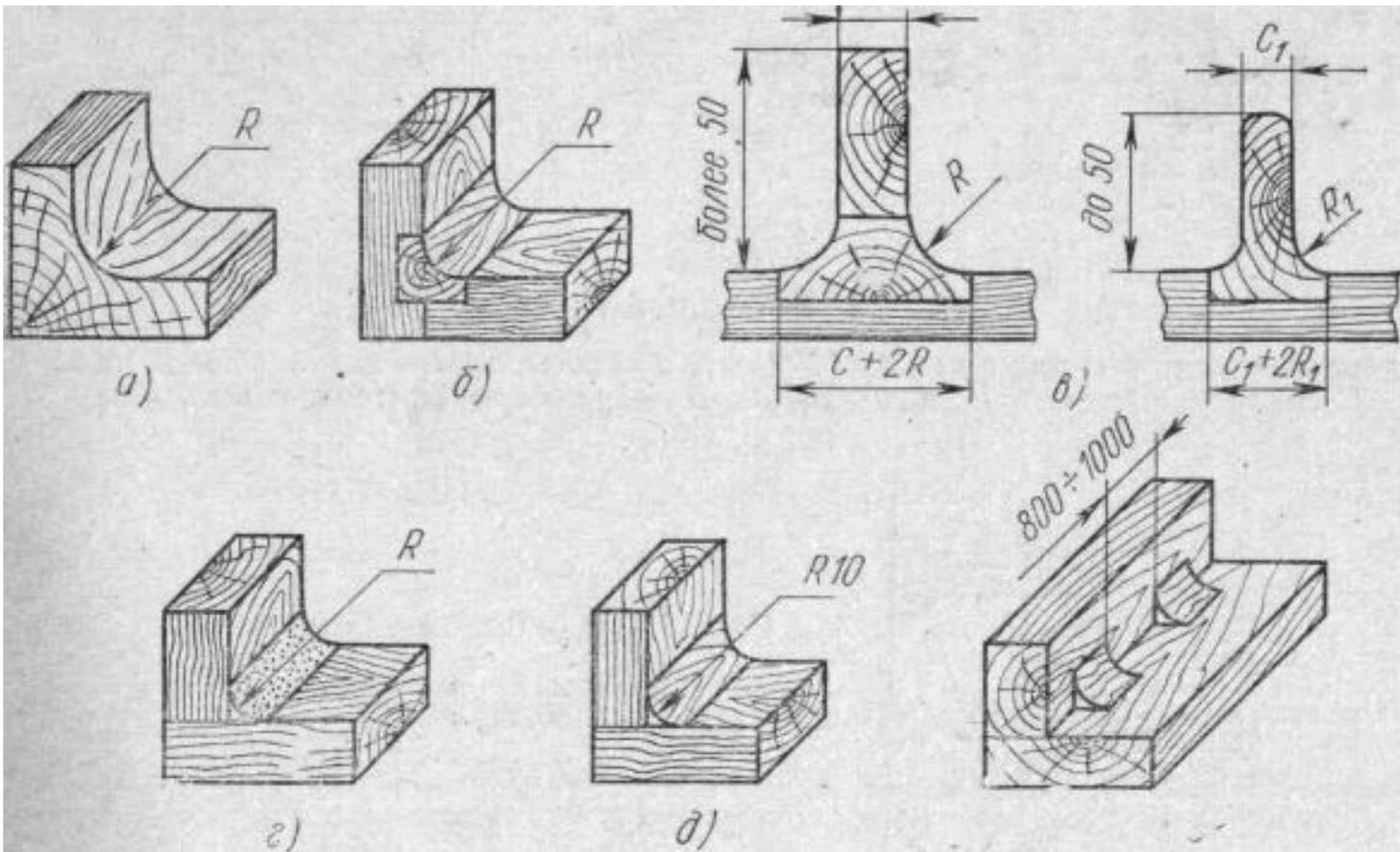


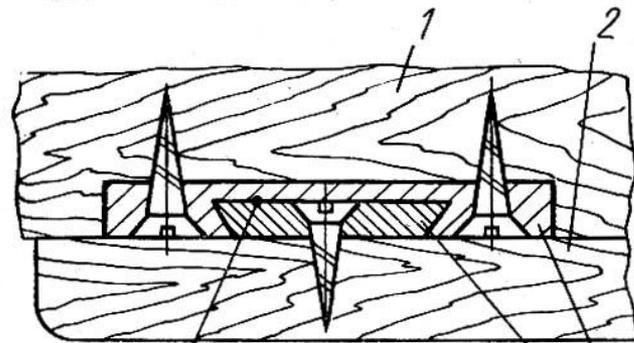
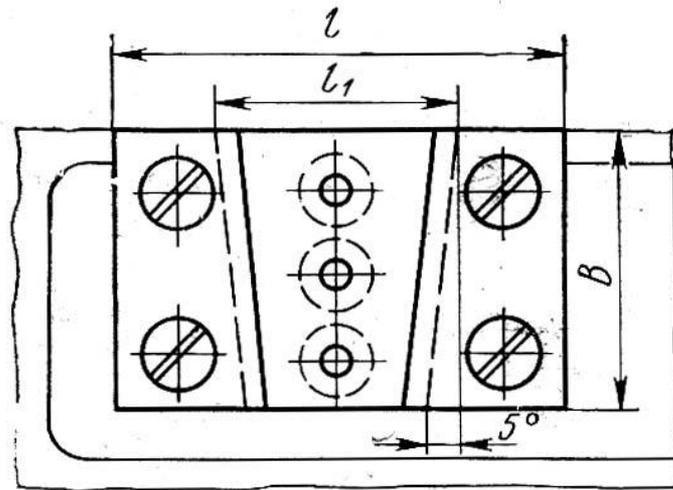
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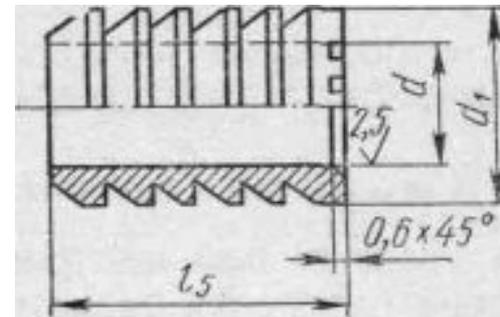
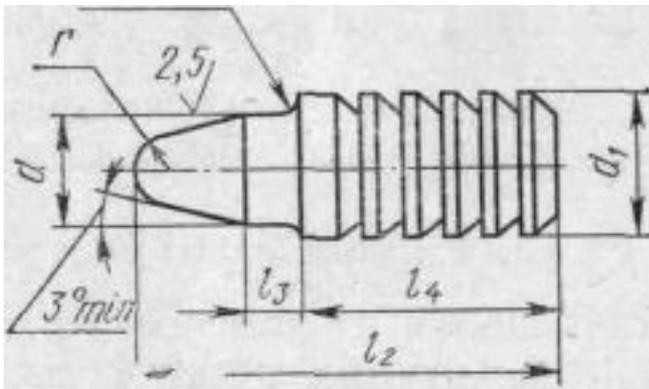
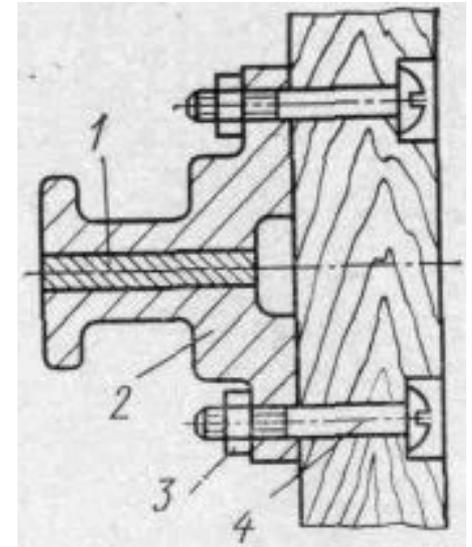
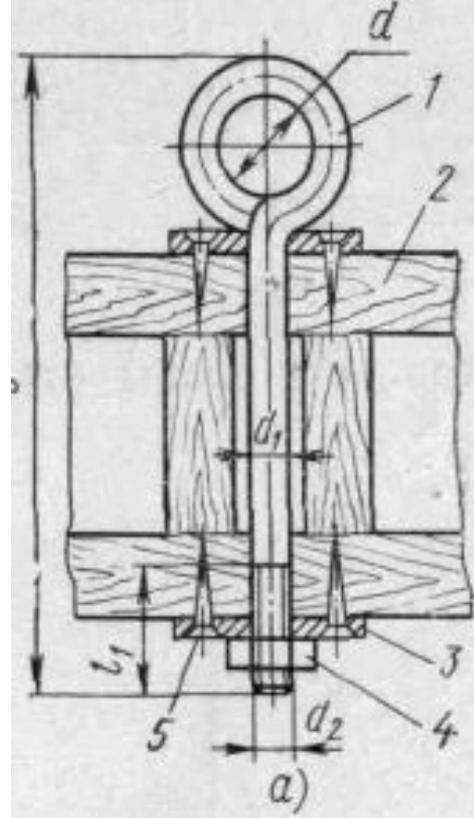
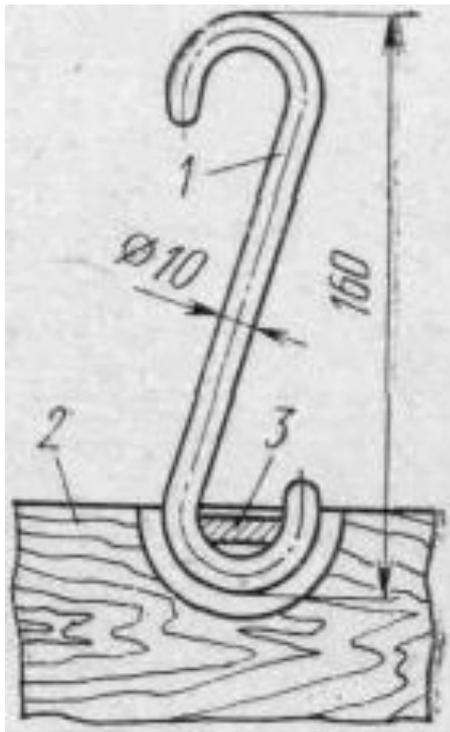
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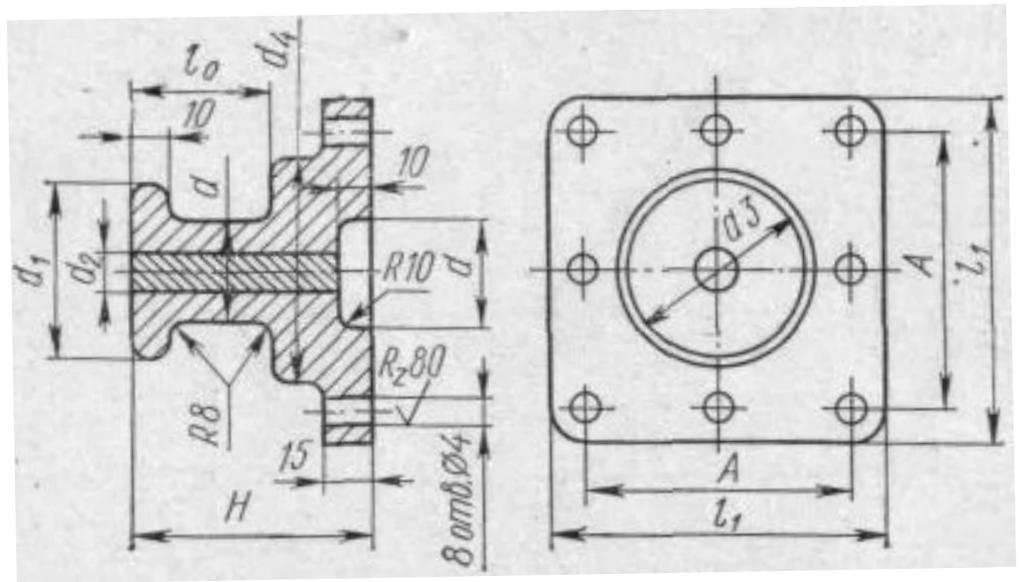
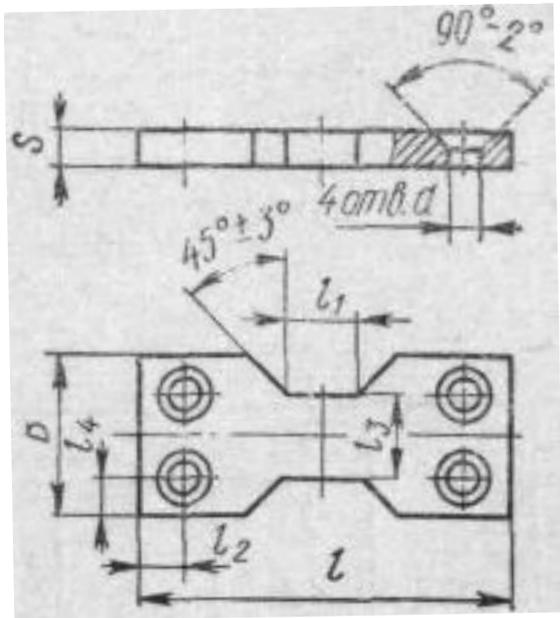


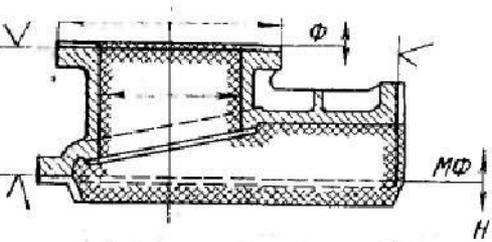




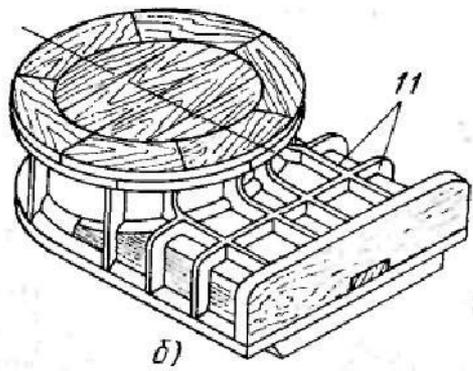
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размера пластины $1-2^\circ$



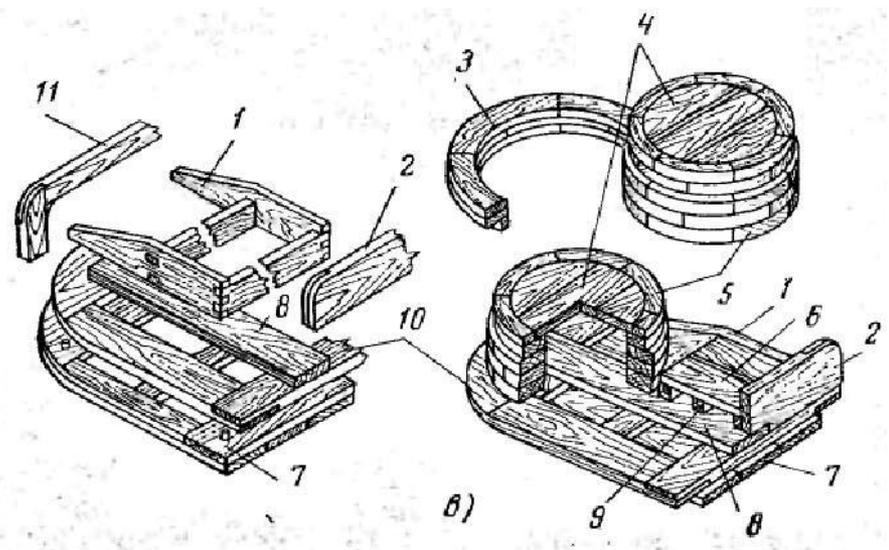




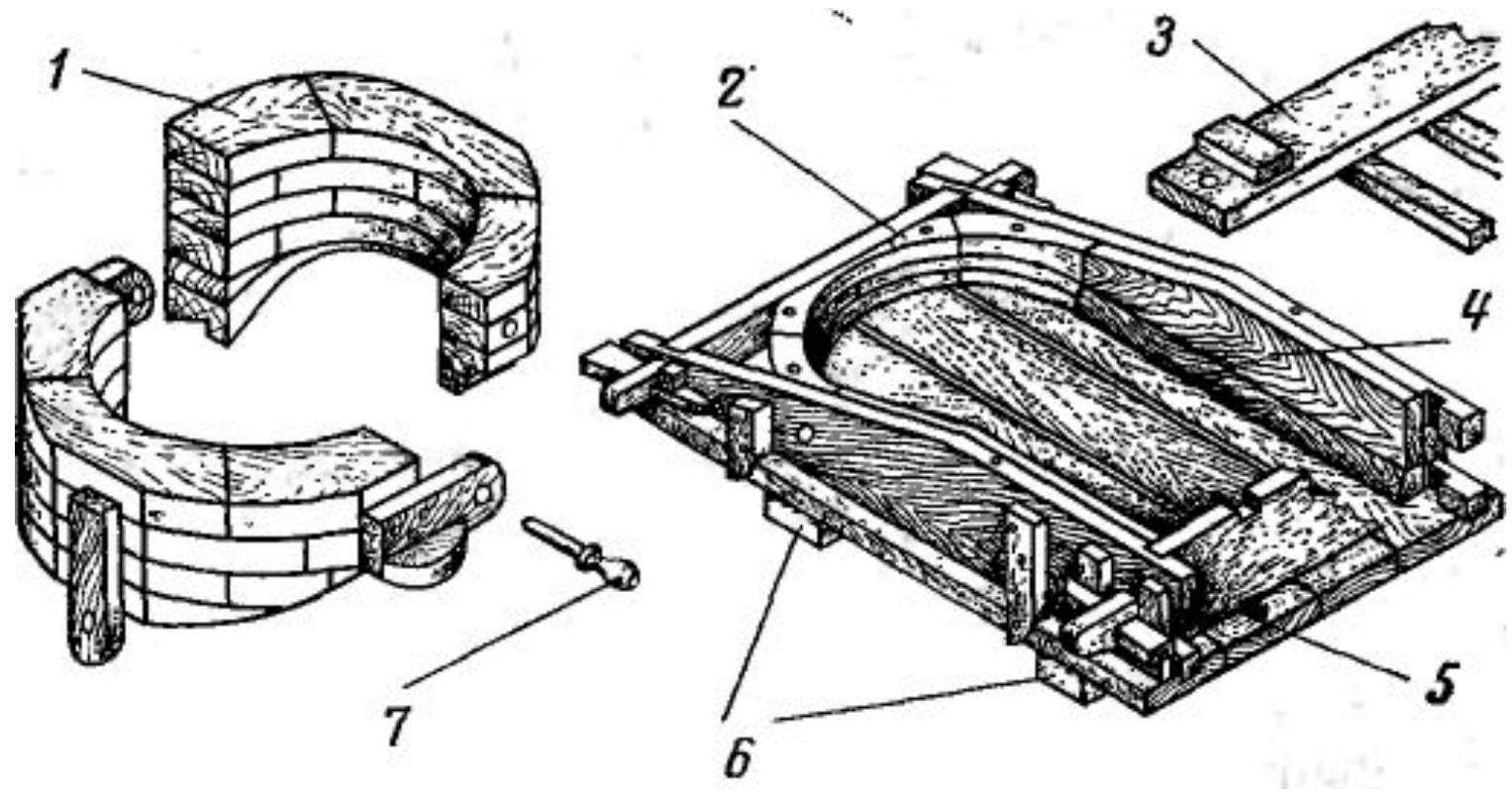
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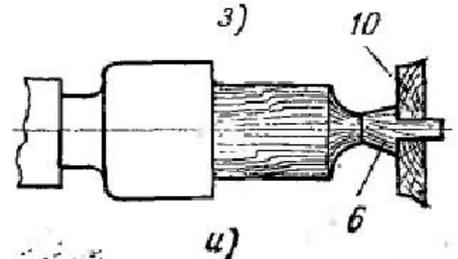
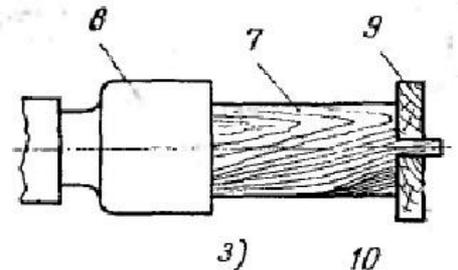
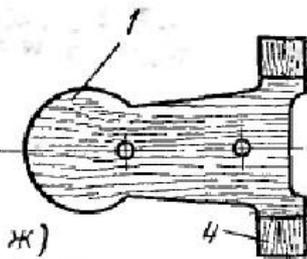
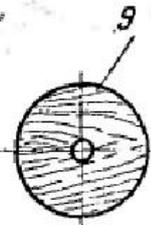
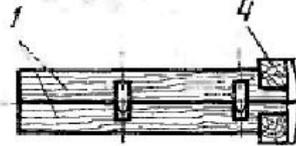
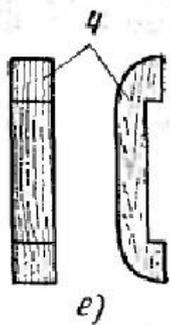
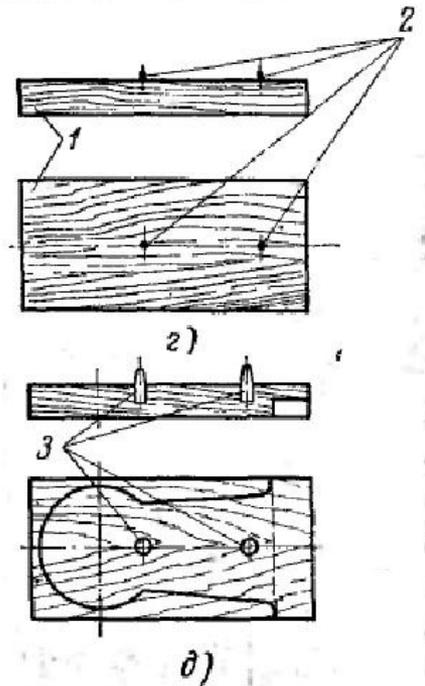
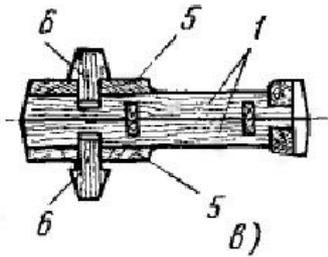
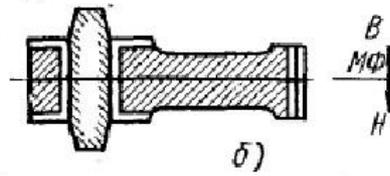
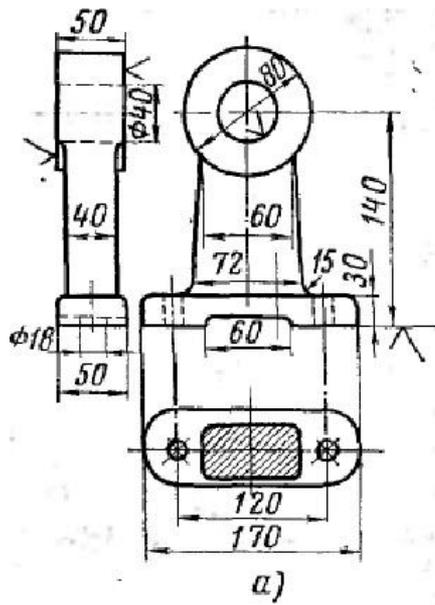


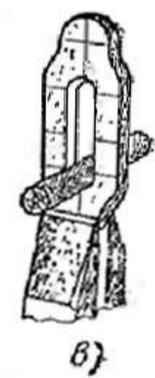
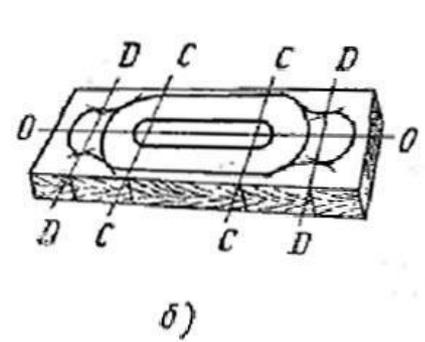
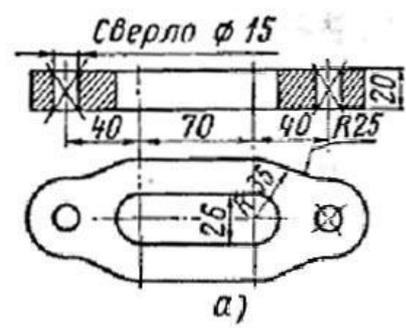
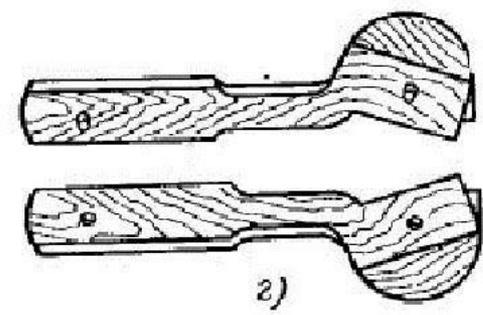
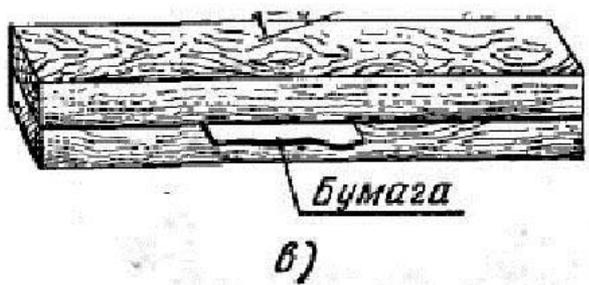
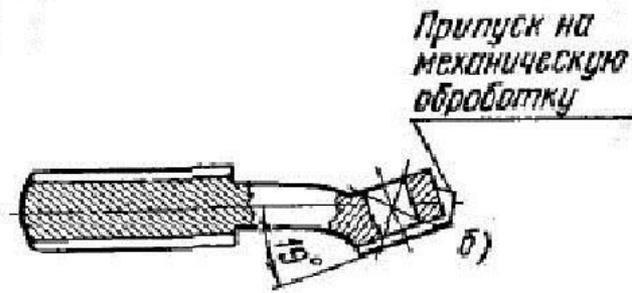
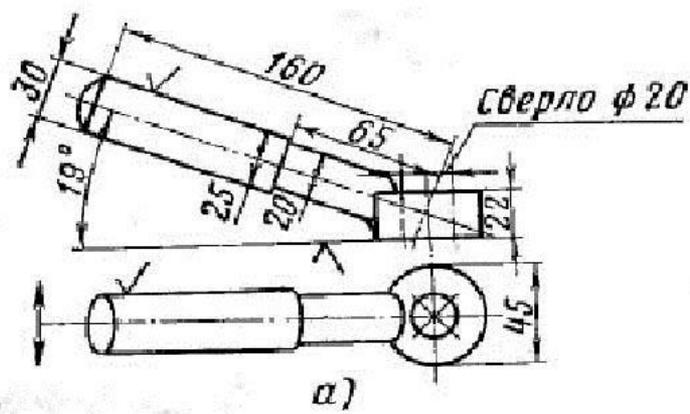
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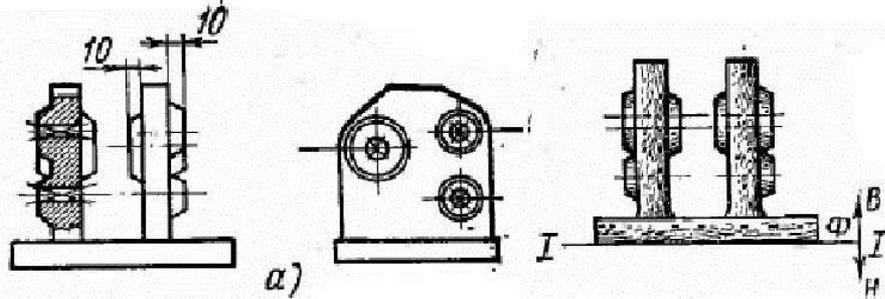


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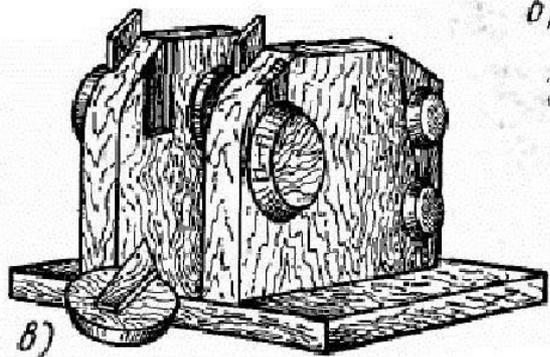




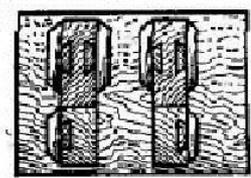


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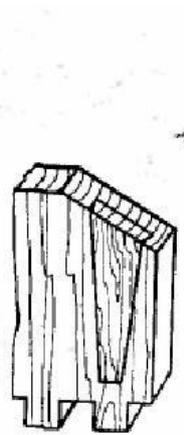
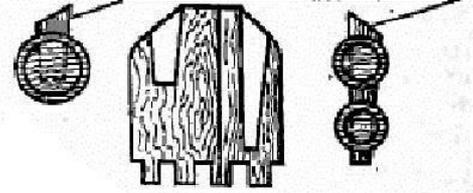
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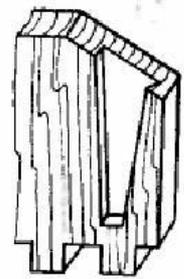
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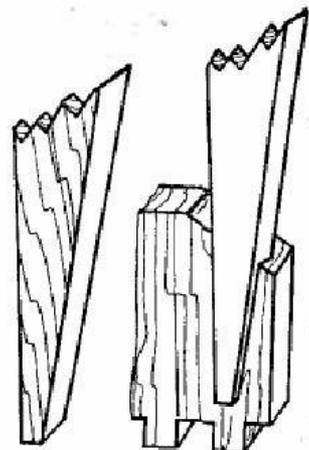
Отъемные бобышки



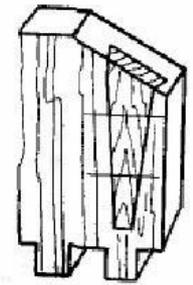
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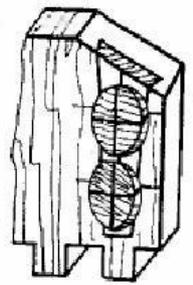
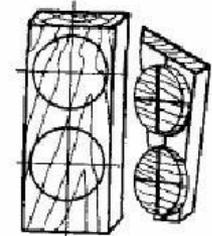
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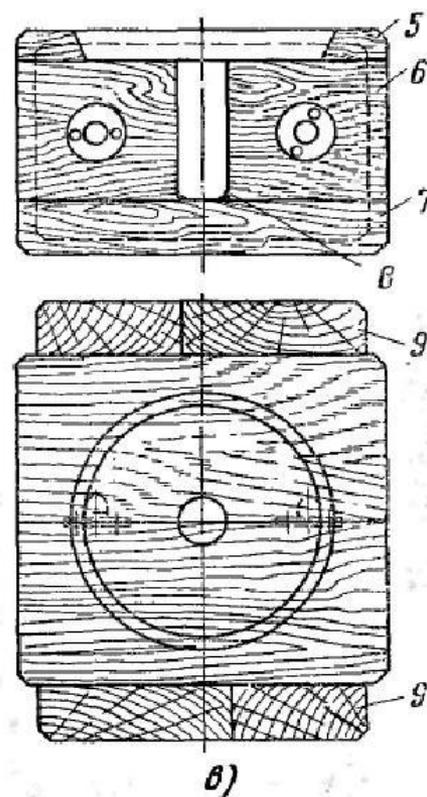
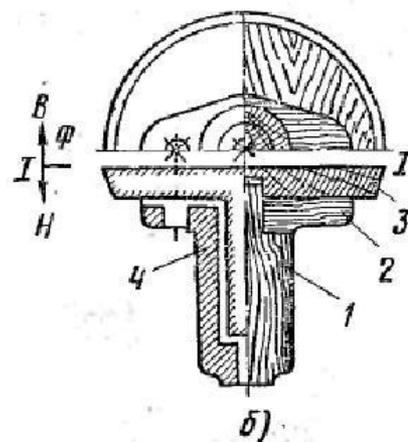
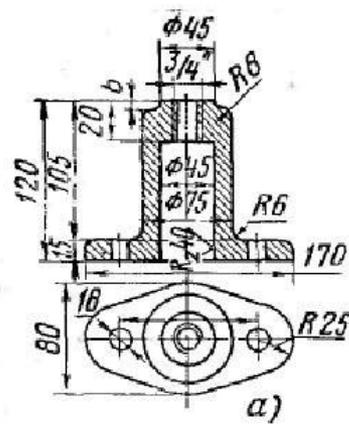
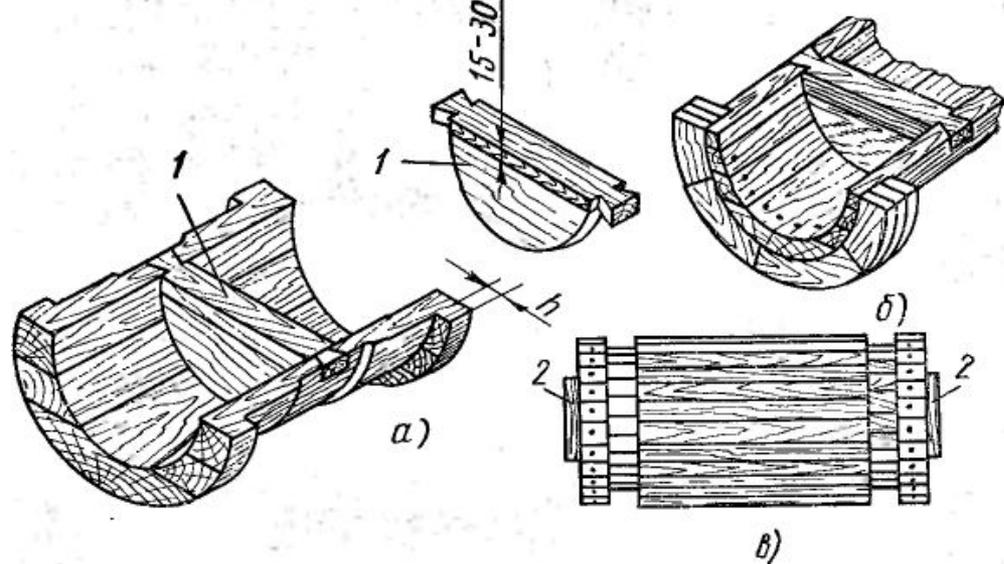
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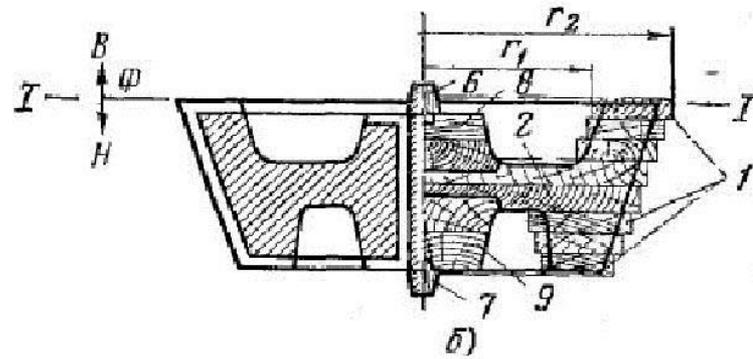
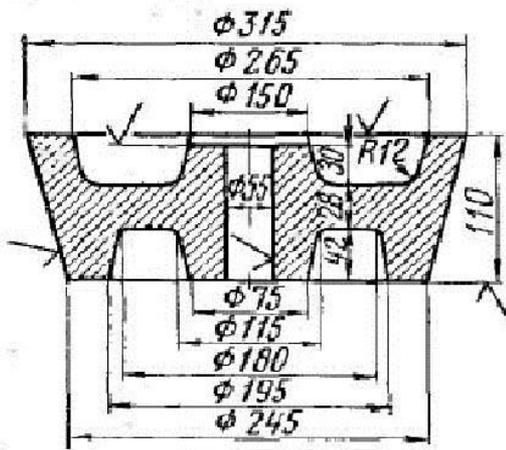


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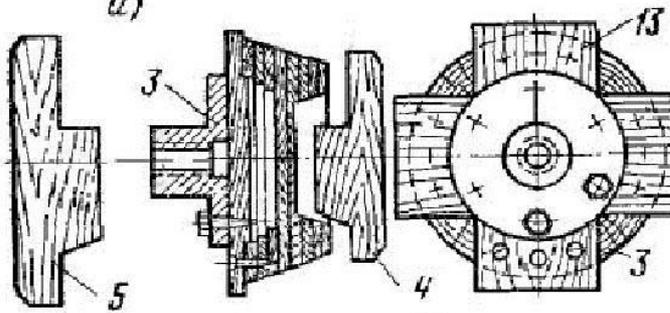


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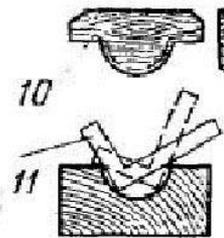




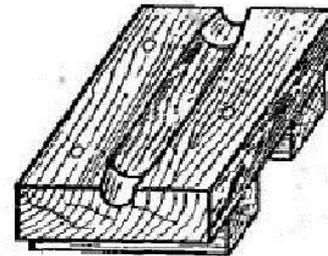
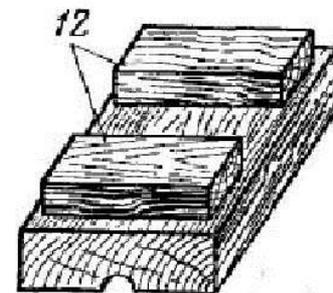
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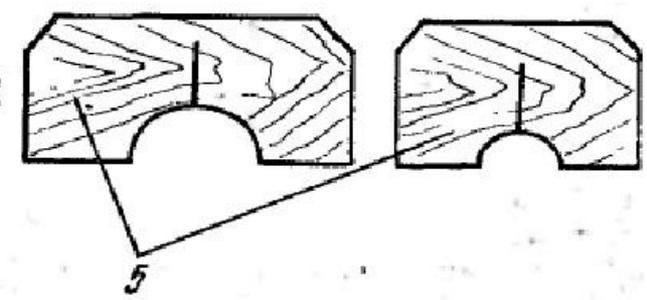
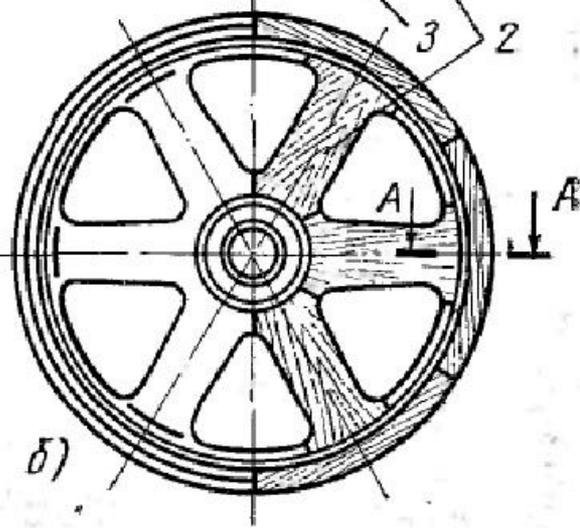
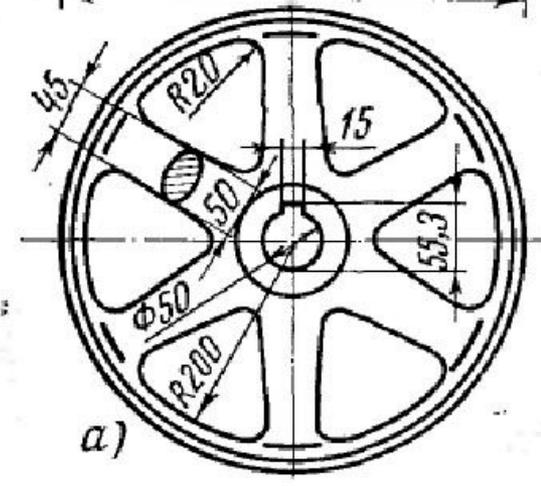
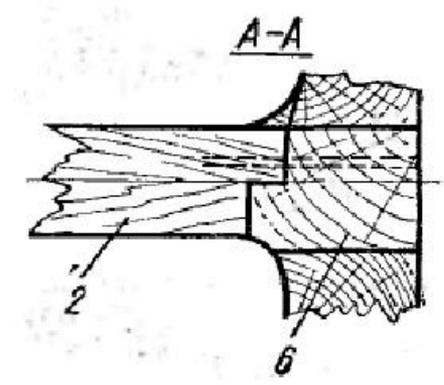
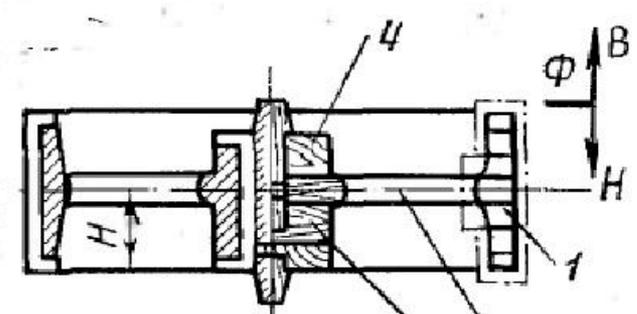
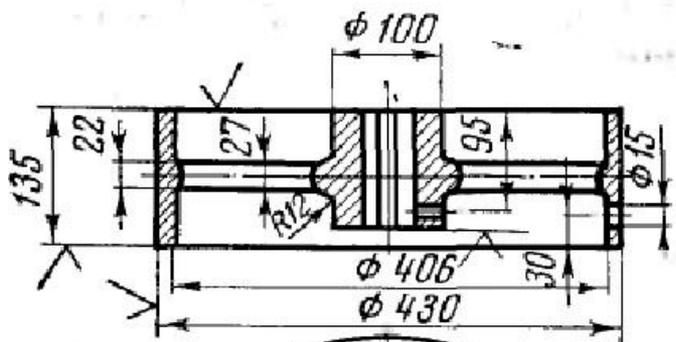


b)



a)

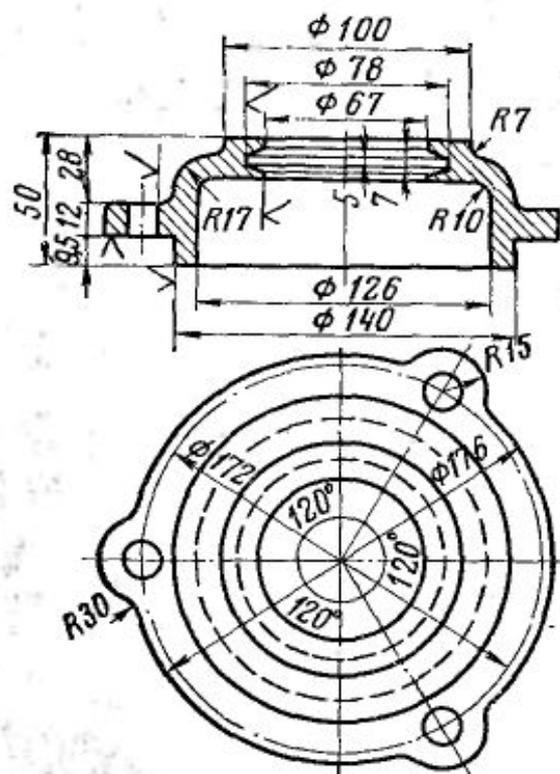




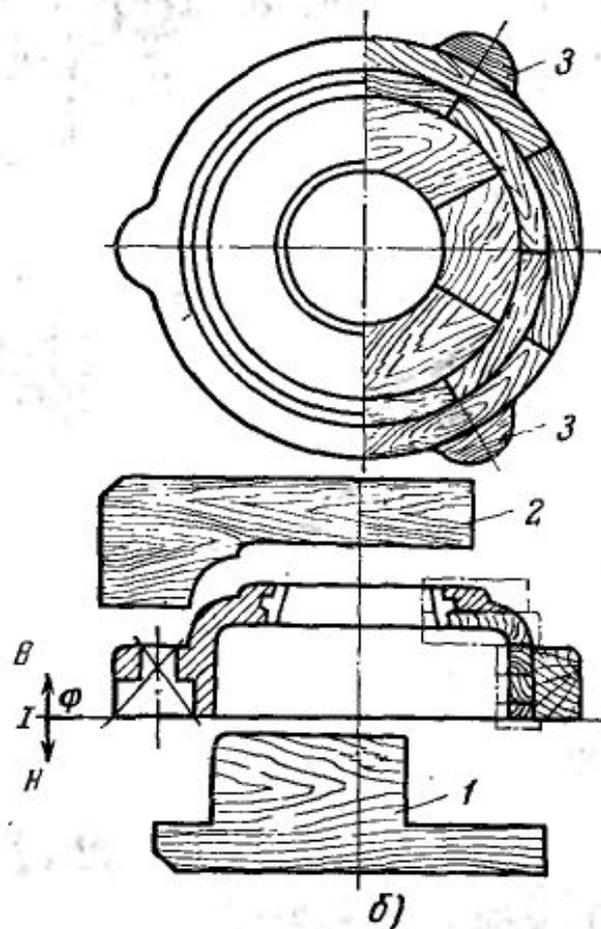
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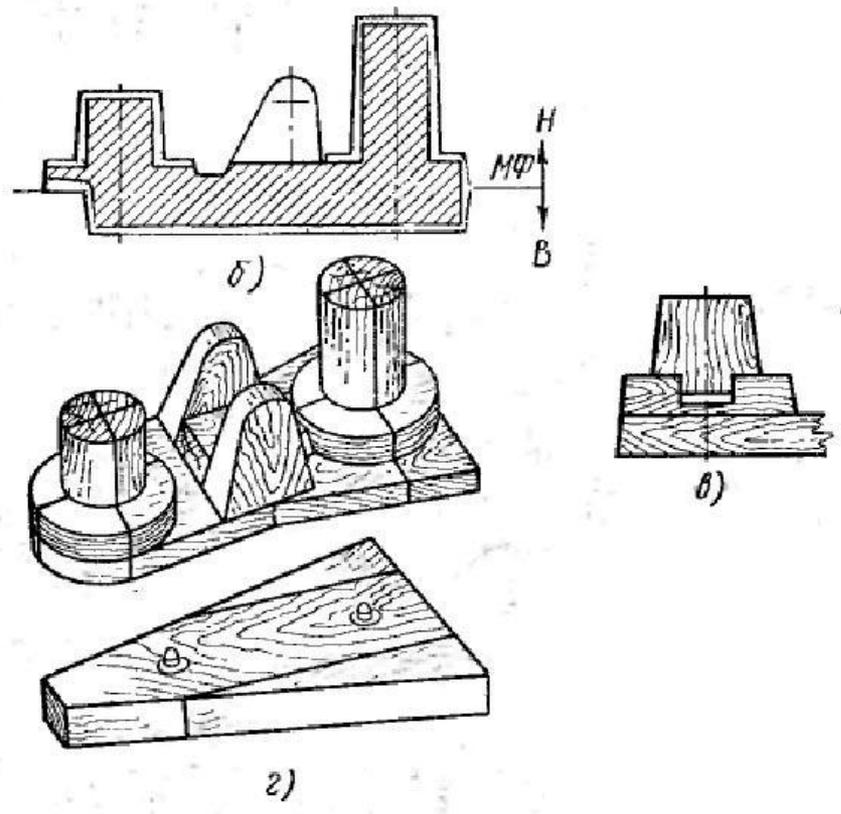
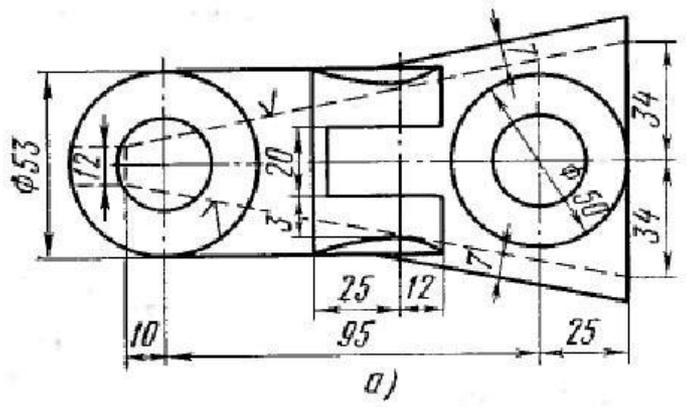
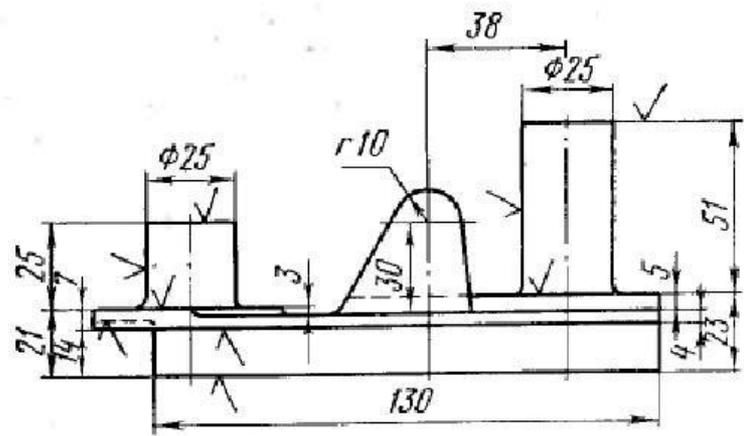
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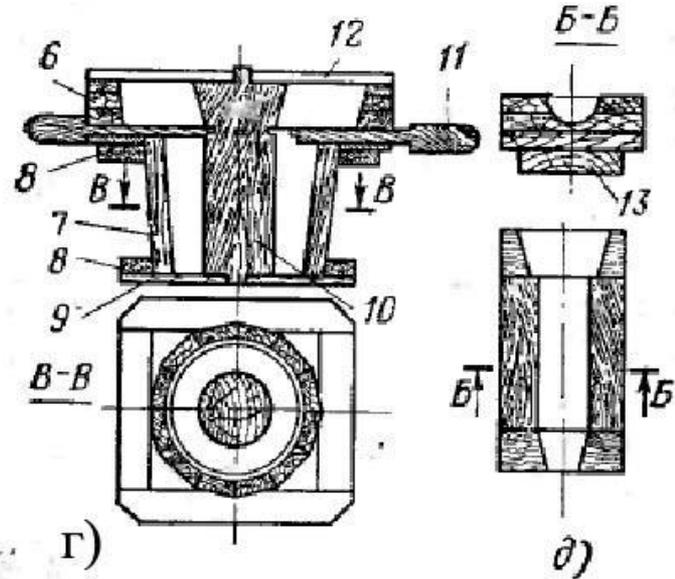
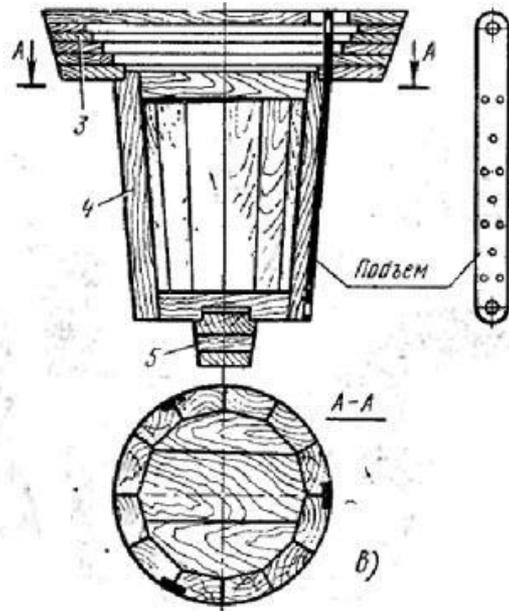
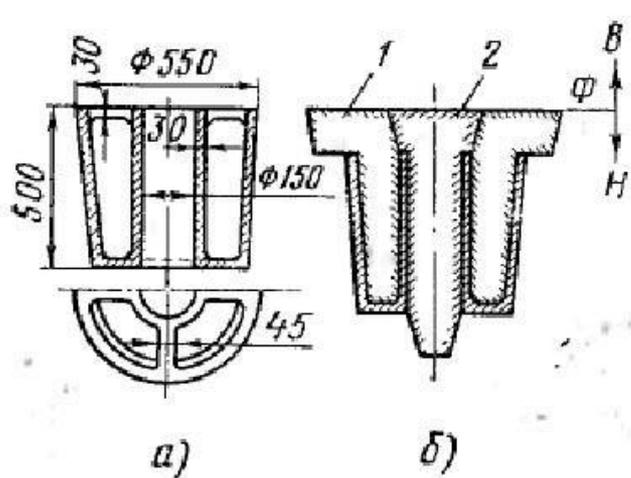
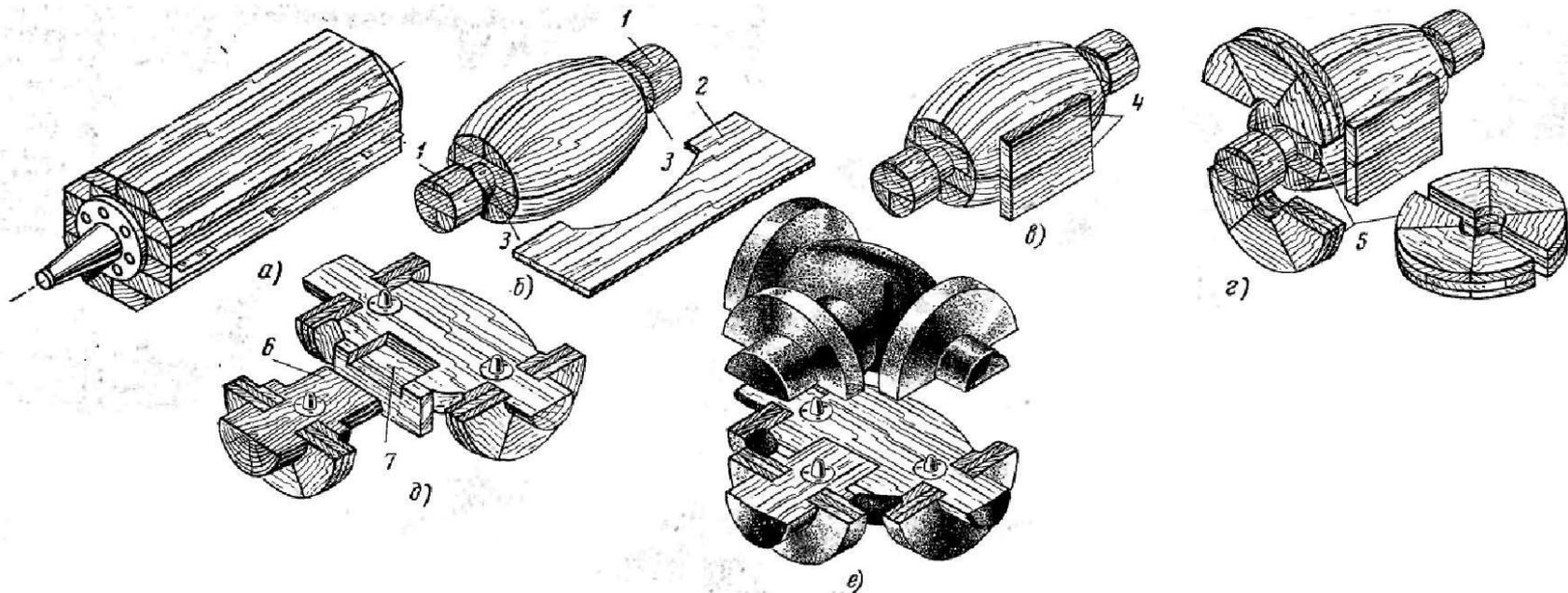


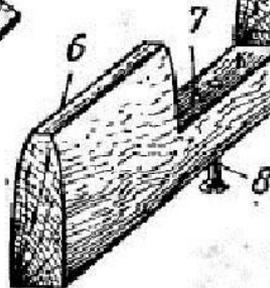
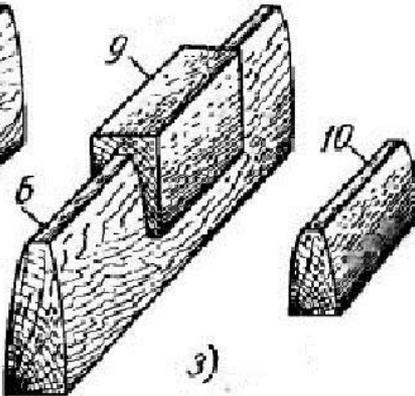
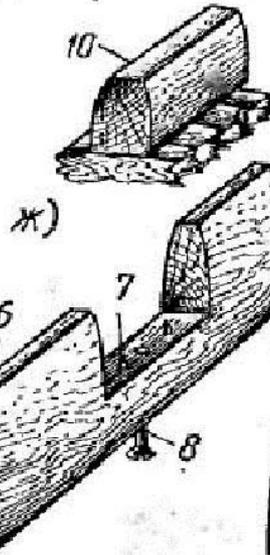
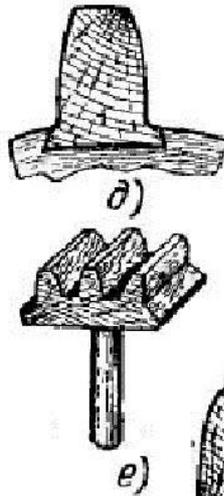
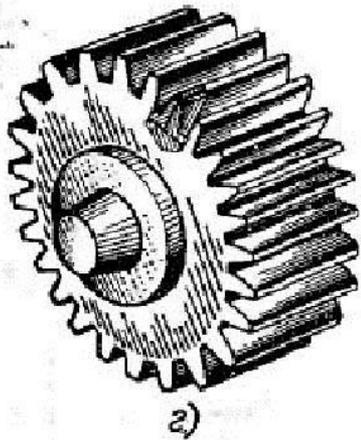
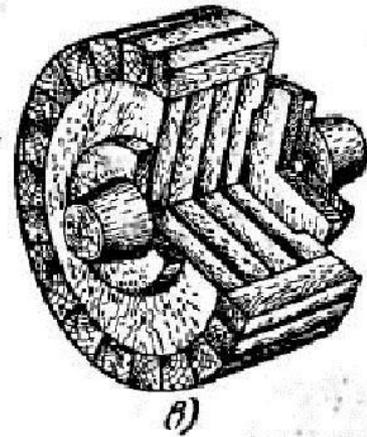
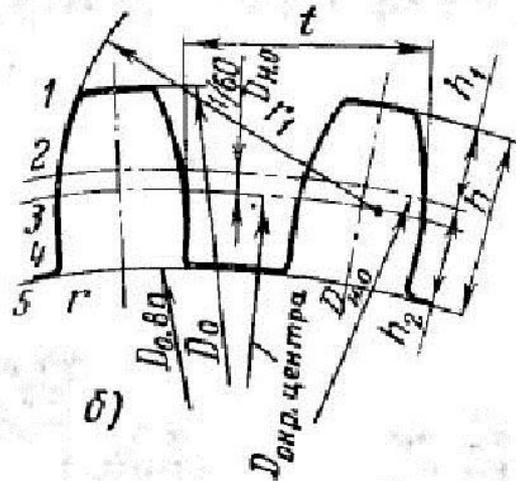
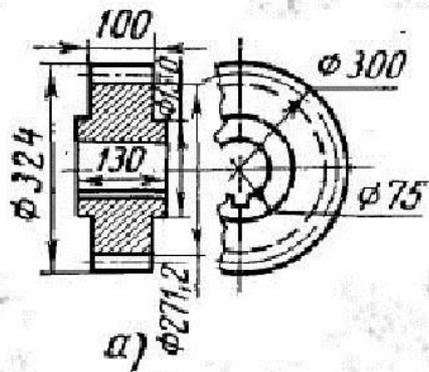
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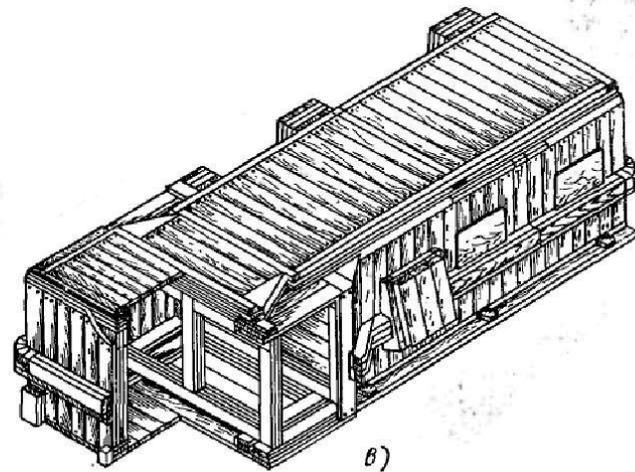
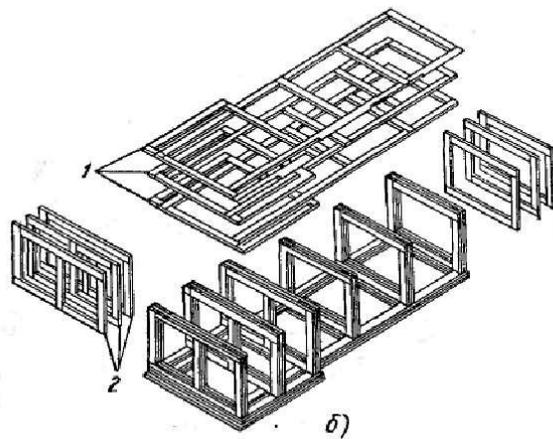
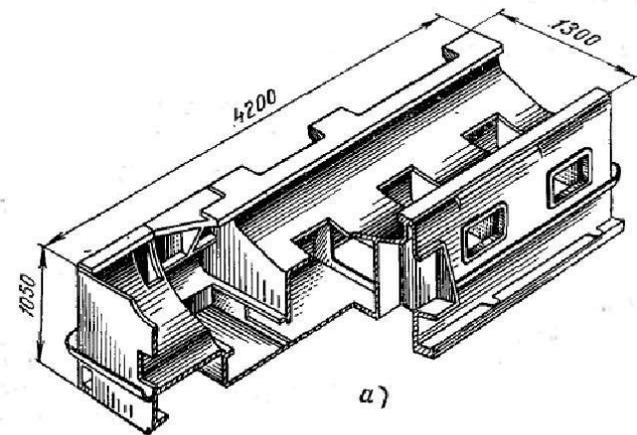


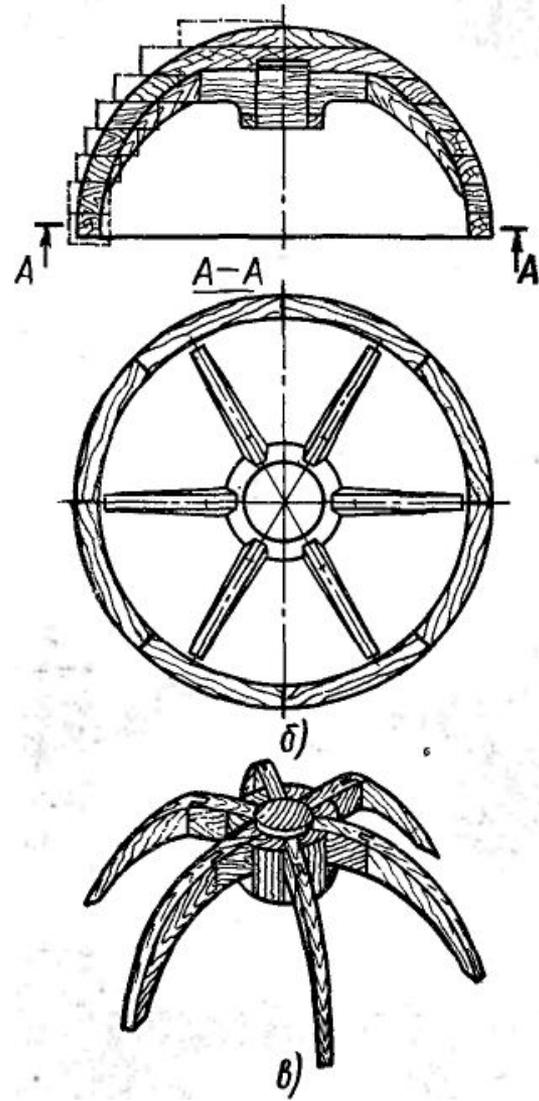
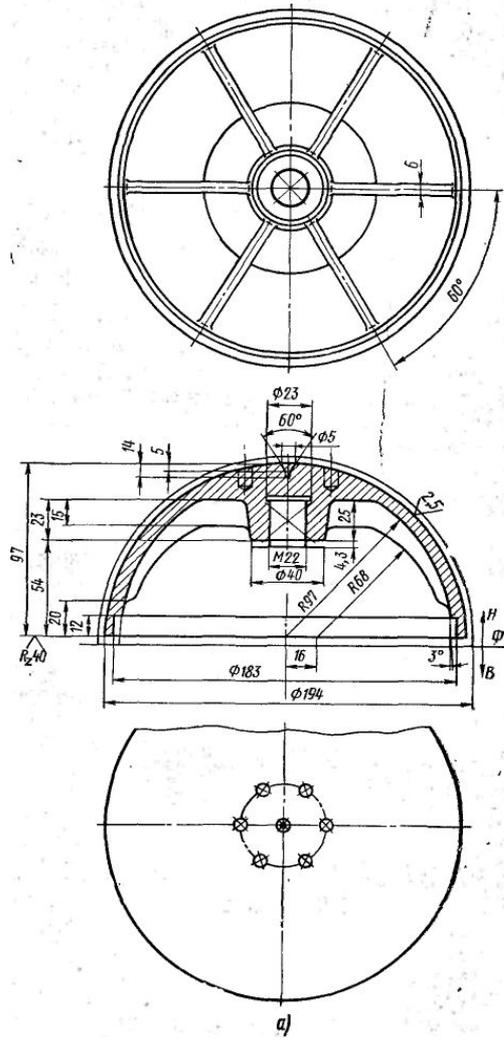
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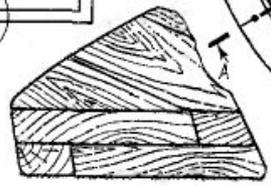
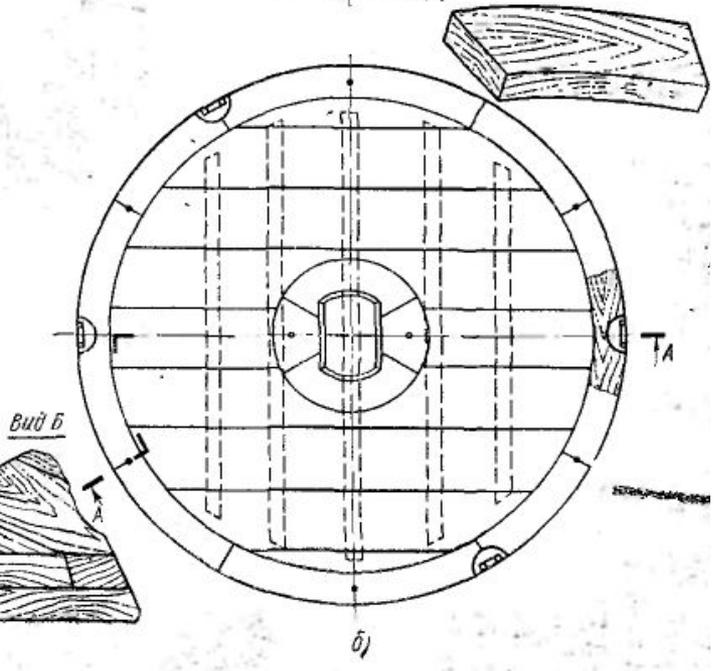
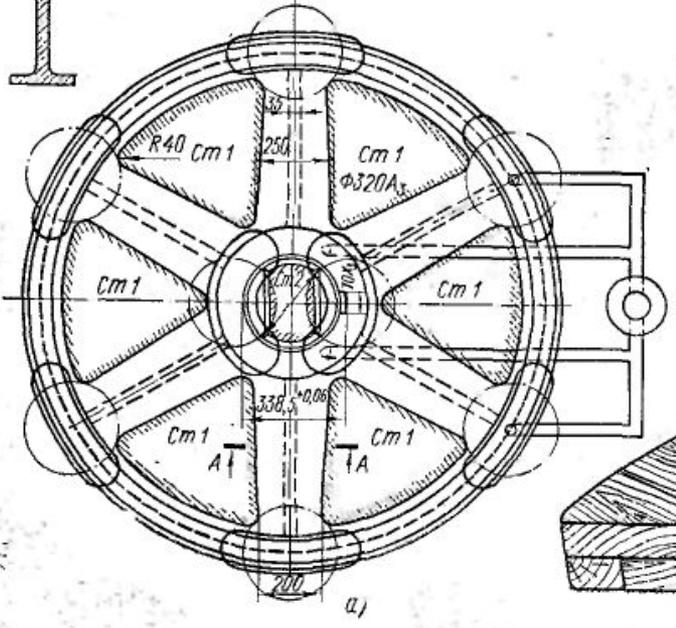
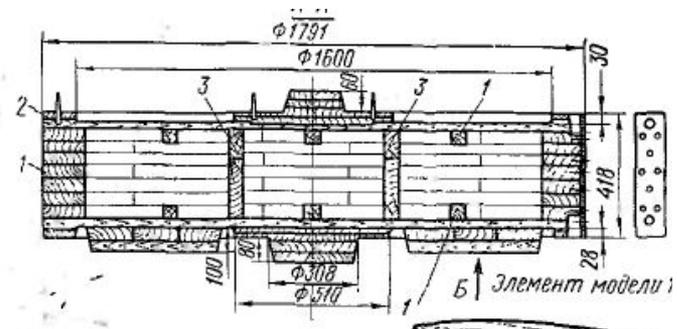
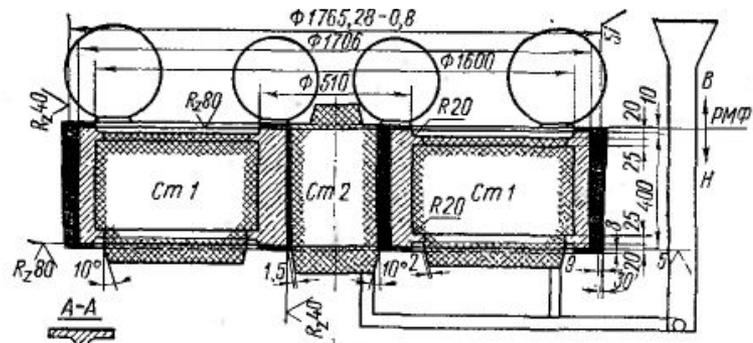


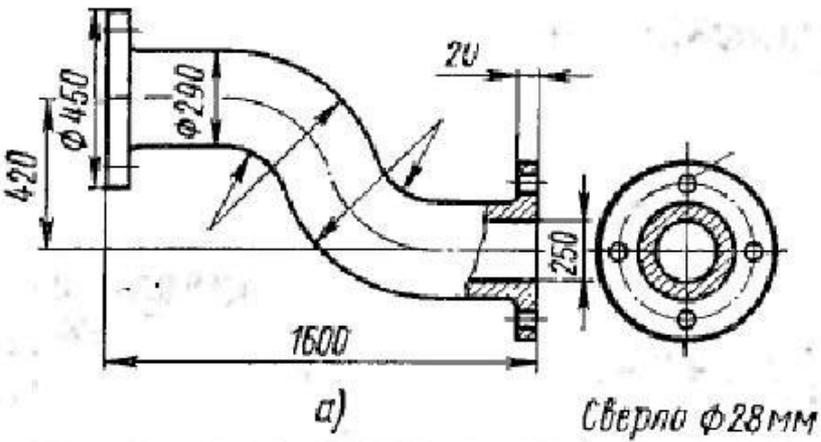




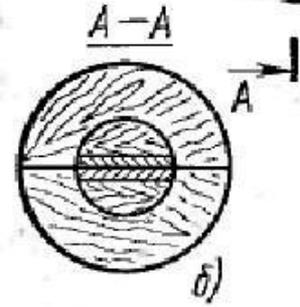
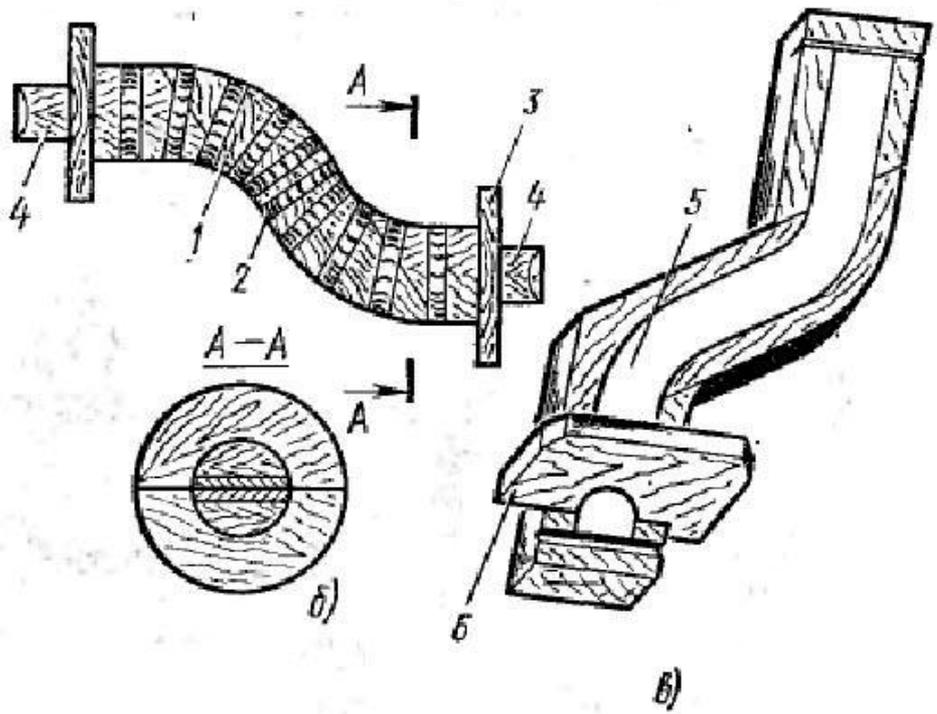


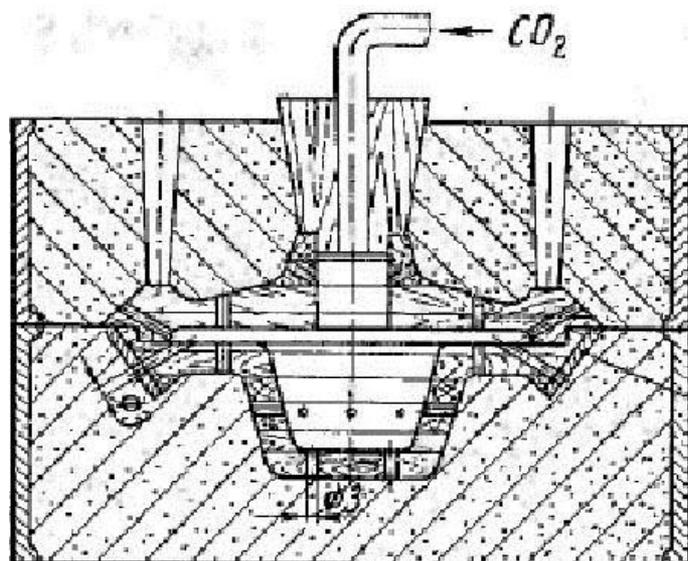




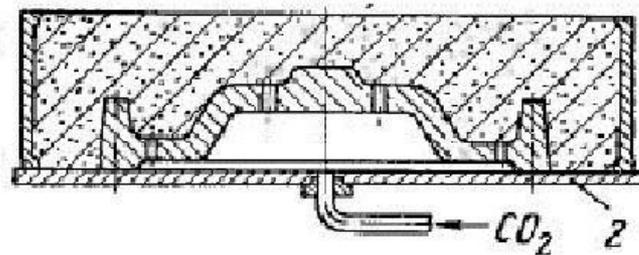


Сверло $\Phi 28$ мм

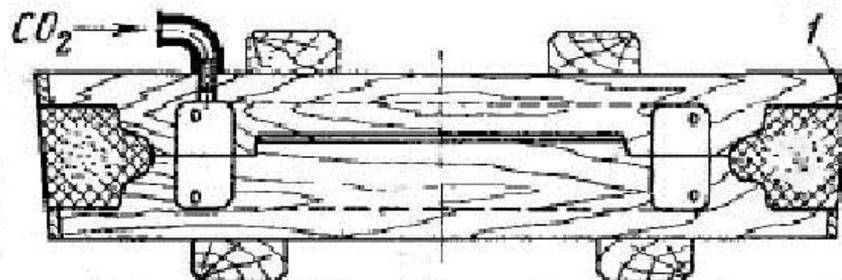




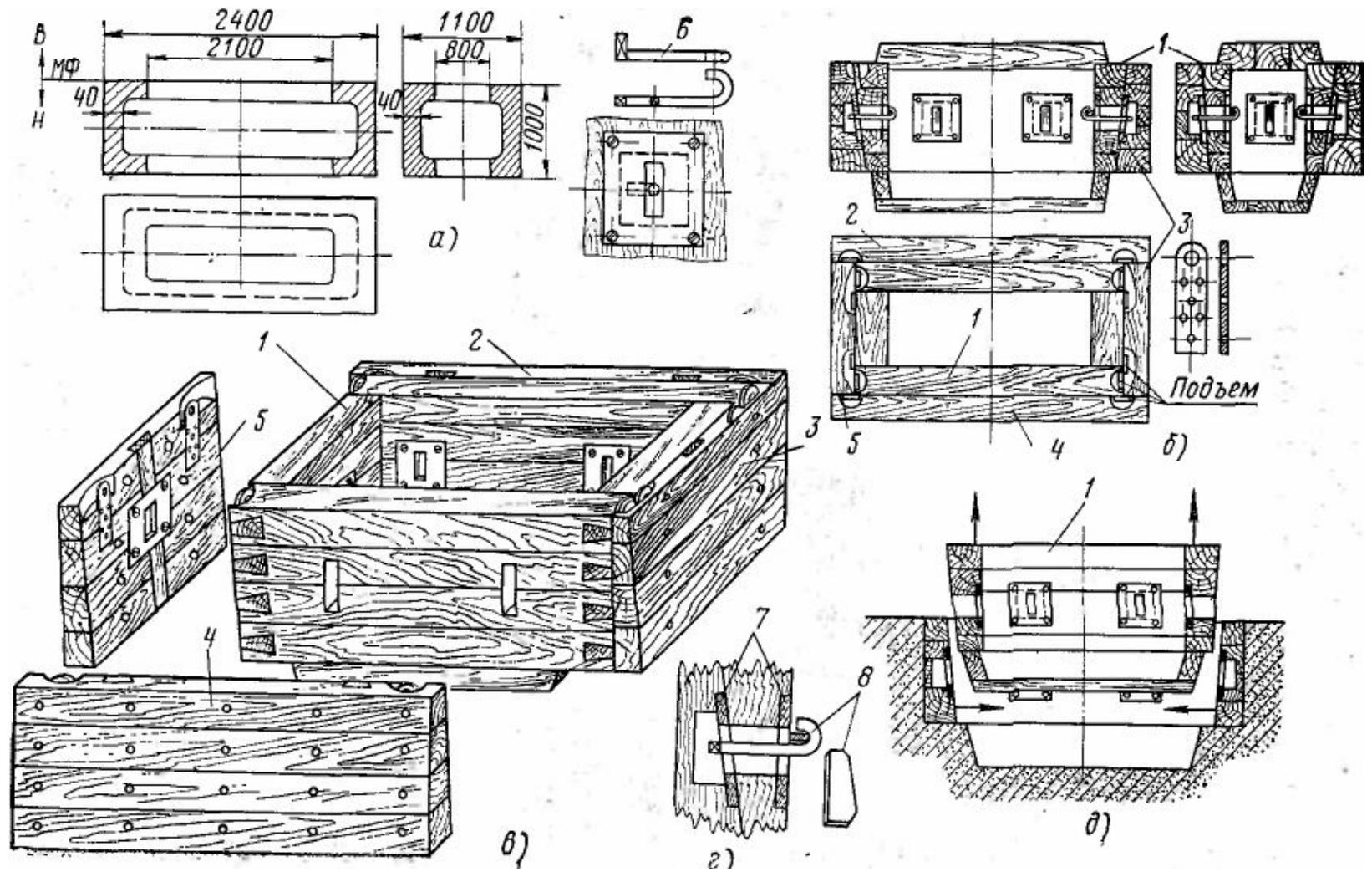
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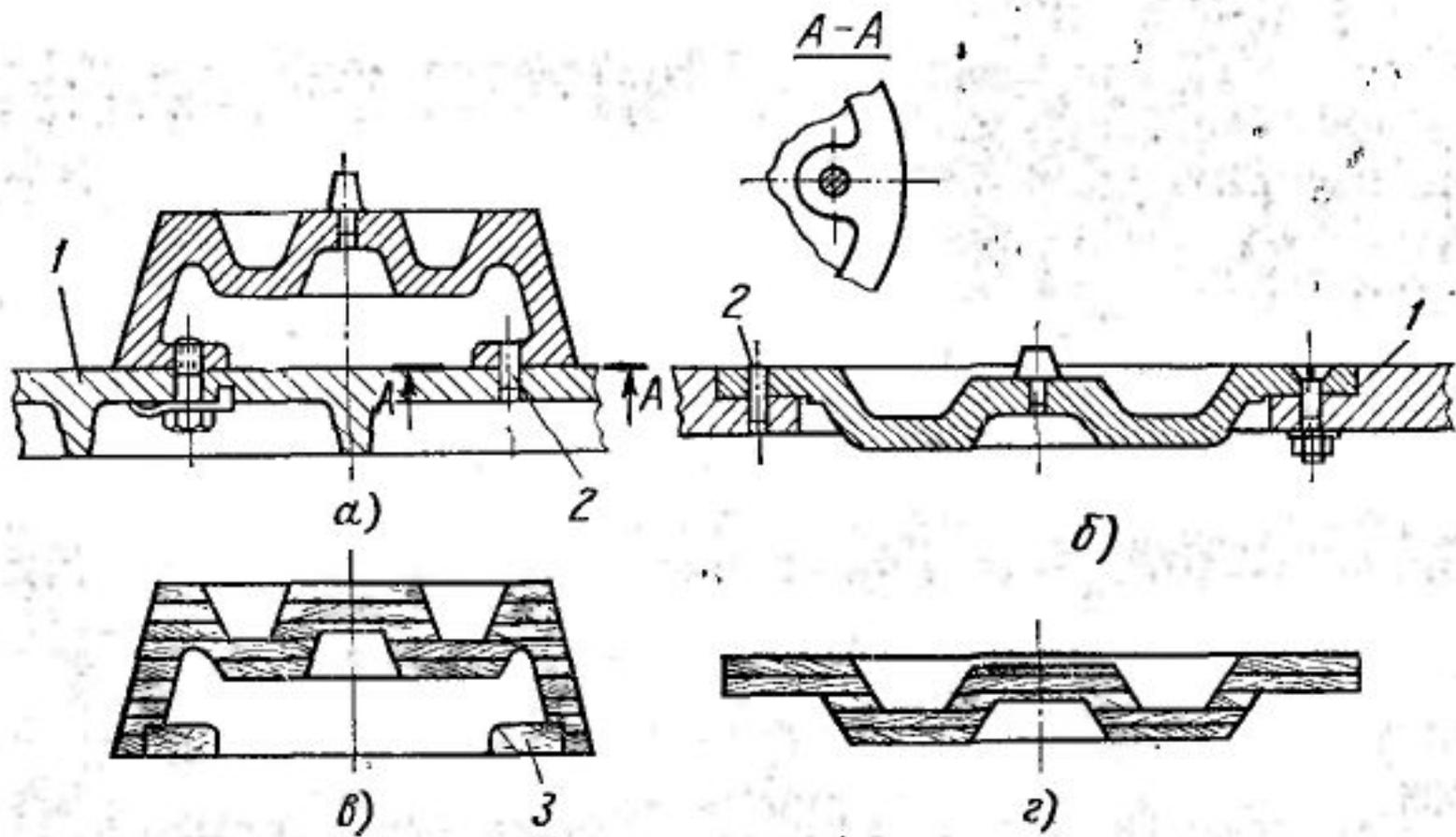


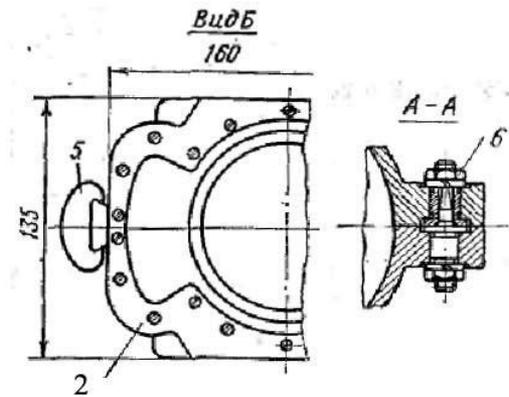
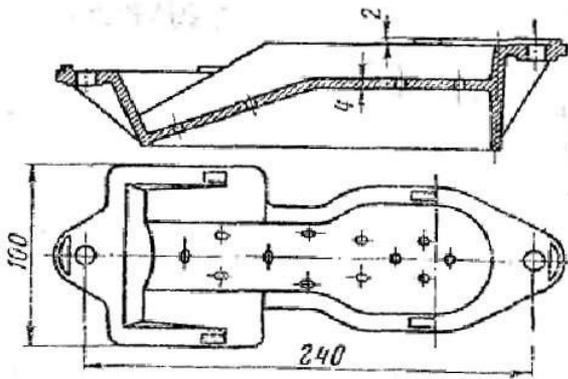
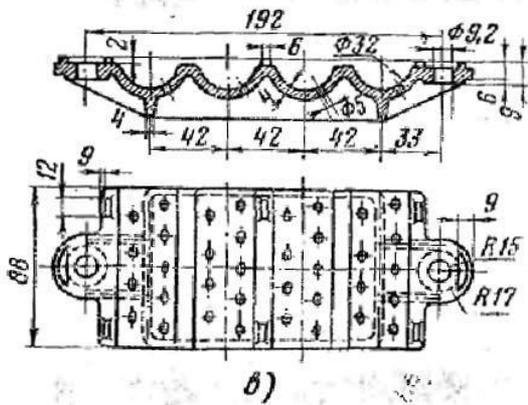
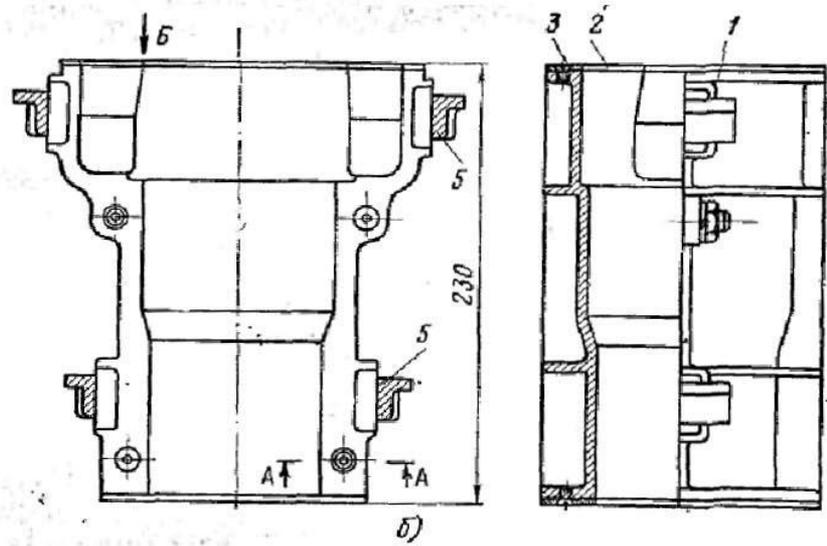
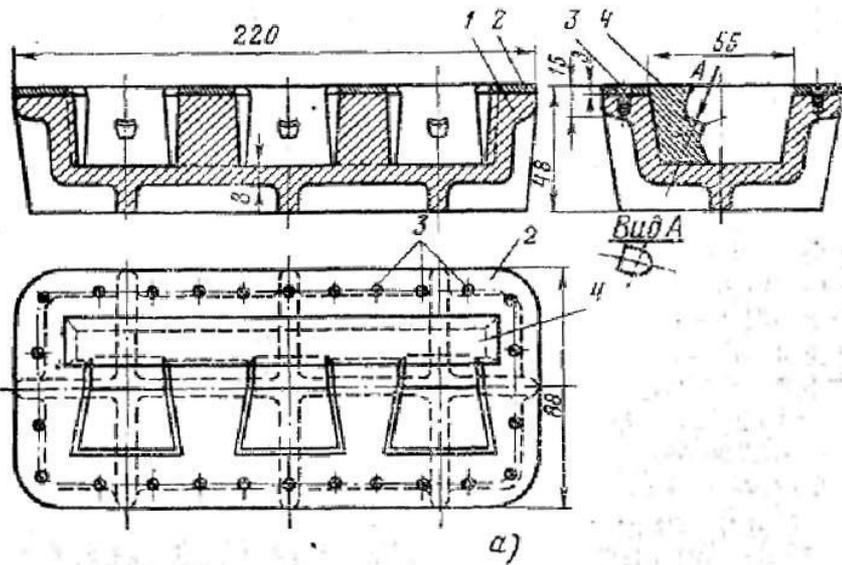
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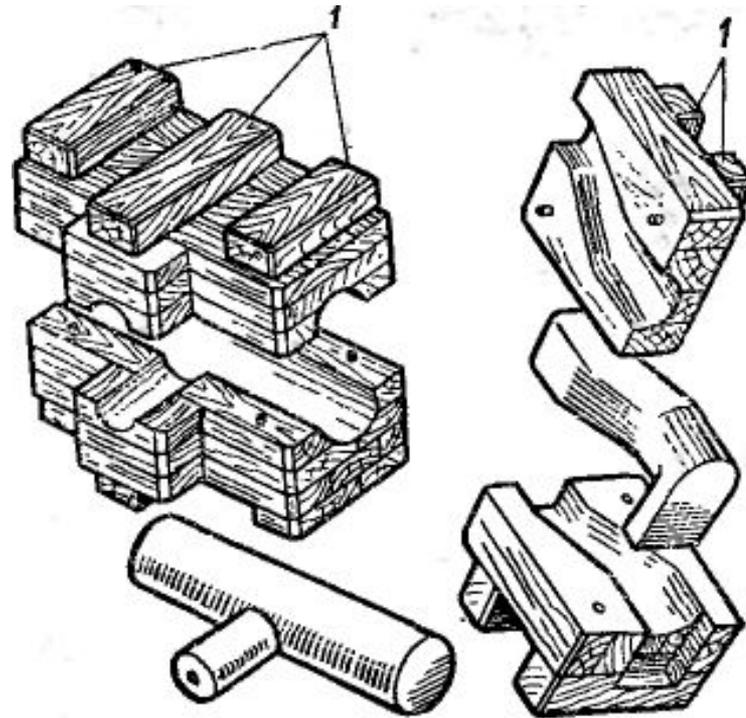
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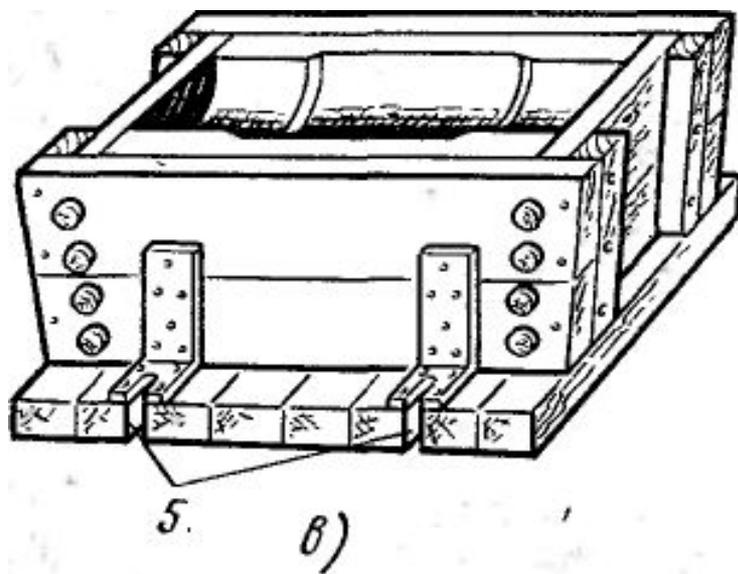
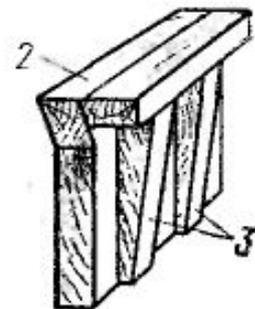
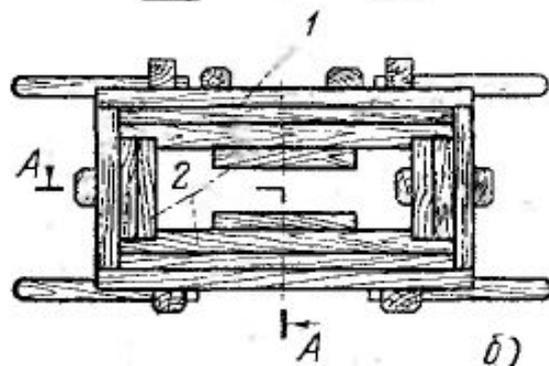
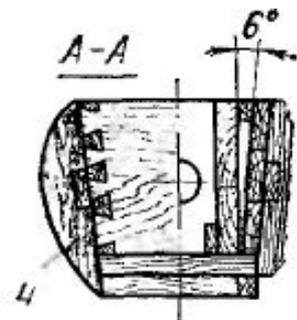
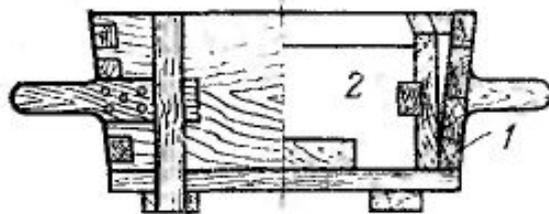
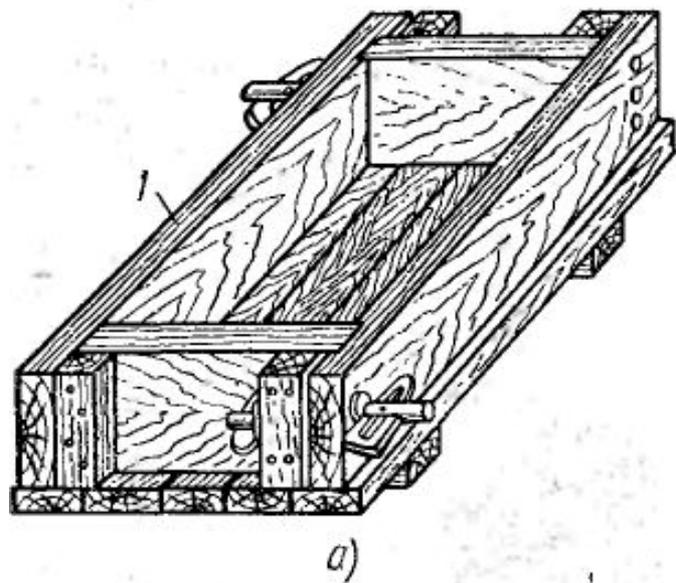


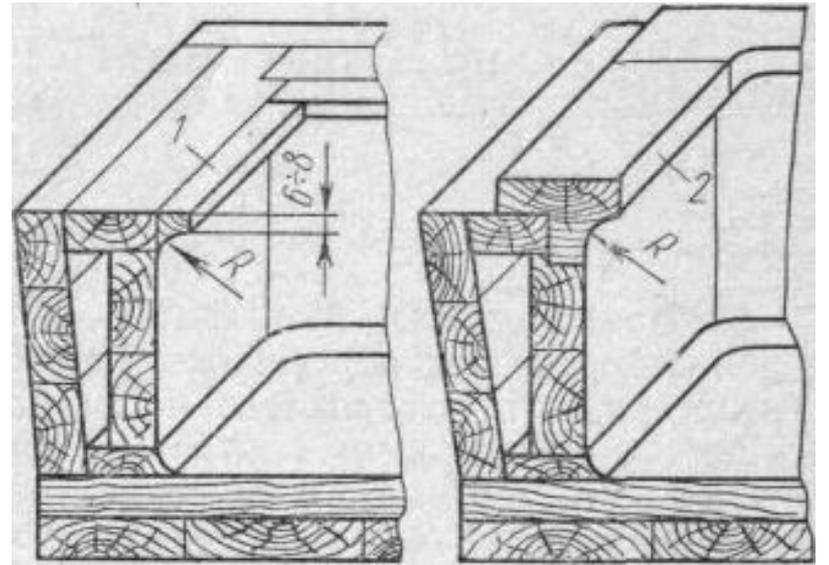
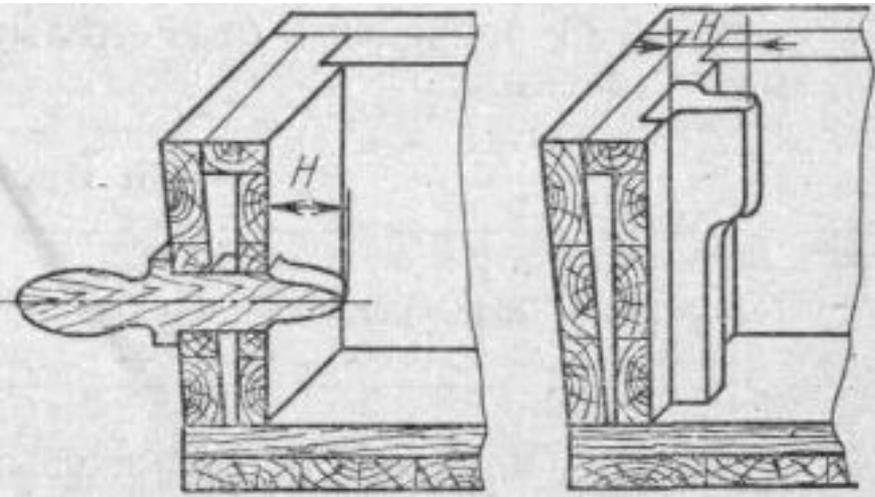
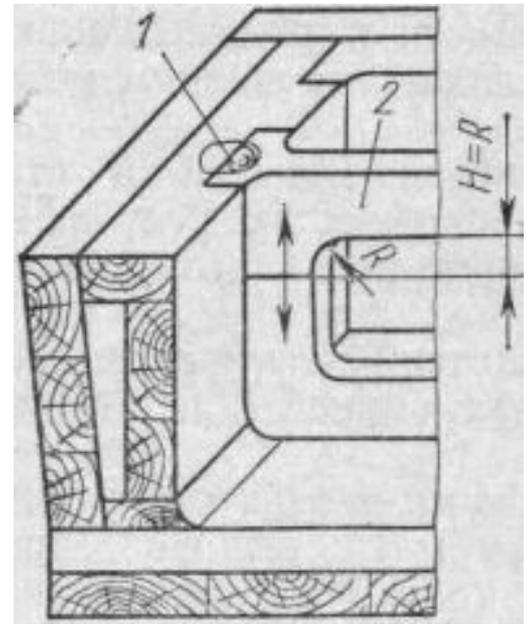
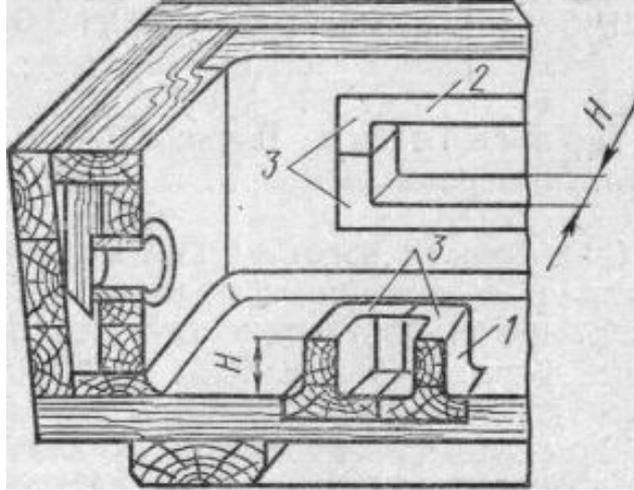
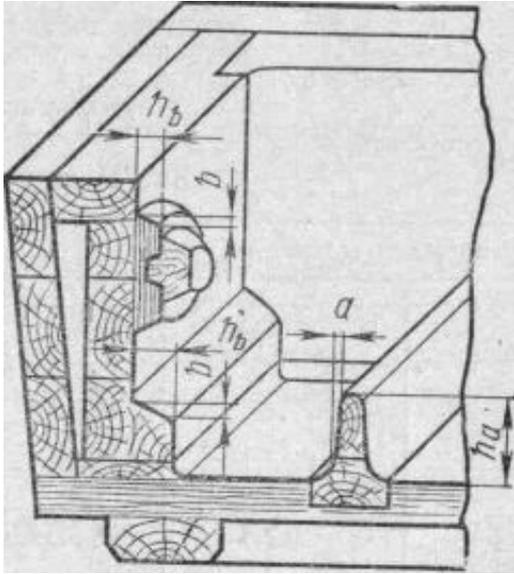


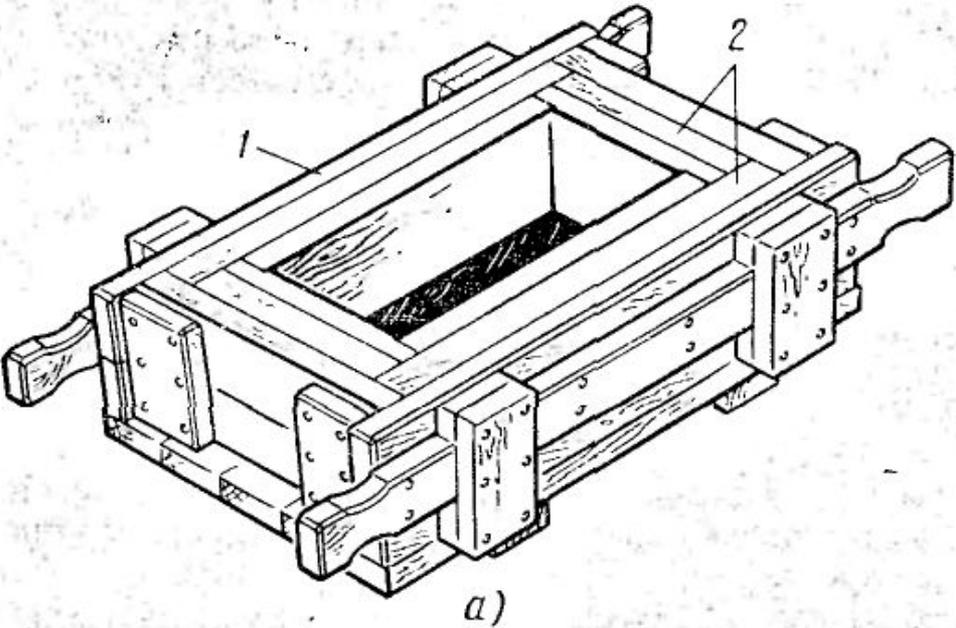


Деревянные стержневые ящики

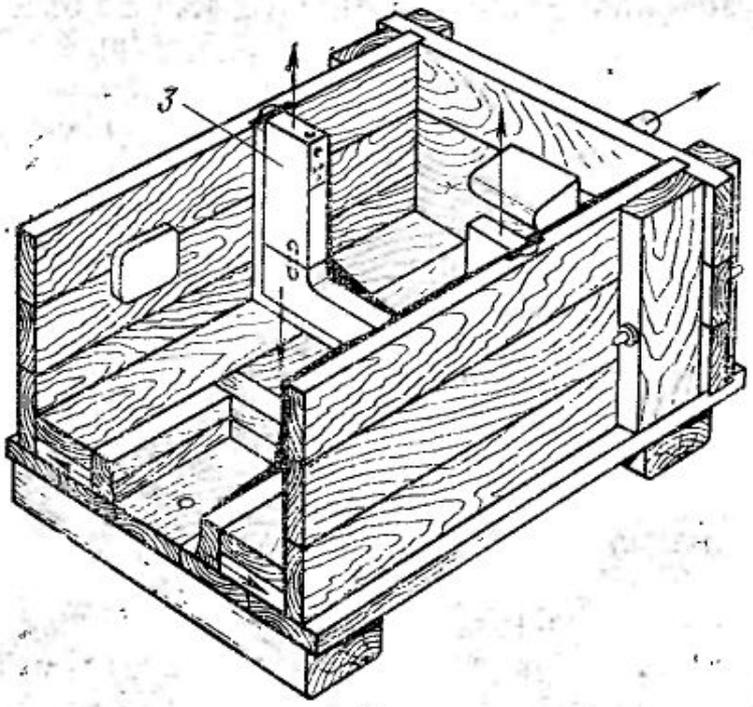




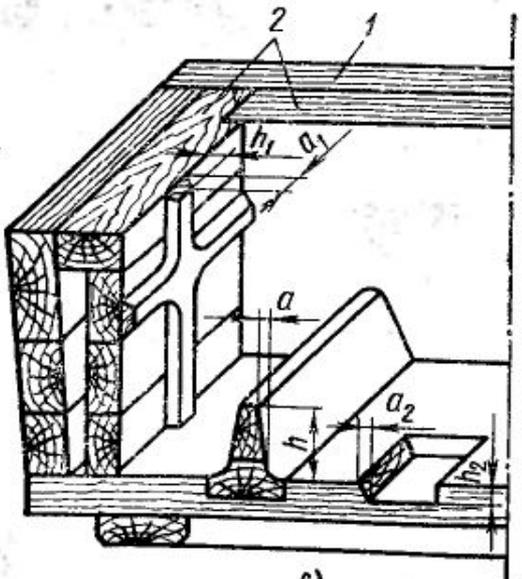




a)



b)



b)

